PLASTICS

A Periodical Devoted to the Manufacture and Use of Composition Products

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Testing for correct Steam Pressures *and* Mold Temperature is important

CORRECT and uniform pressure and heat are essential for the production of the best Bakelite Molded parts. The steam gauge should be checked at intervals, and the reading compared with boiler pressure to see if the usual drop between boiler and line pressures has taken place.

Correct heat of molds is equally important, and this cannot always be determined by gauge pressure reading. Mold temperature should be tested at intervals, using for the purpose a type of thermometer which will give an accurate reading. Every Molding Plant should be provided with at least one of these thermometers.

If temperature is low and there is difficulty in locating the cause, we suggest the following procedure:

1. First look at steam gauge.
2. Examine traps and see that they are dumping at regular intervals.
3. Blow out presses.
4. Blow out line to eliminate any scale that may have formed. Then see that it drains properly.
5. Check platens.
   (a) First chill and then turn on steam to see that they heat uniformly and quickly.
   (b) If they don't heat quickly, look for formation of scale and remove any large accumulation.
   (c) Check channels to see that plugs are located at proper points.
6. As a double check on traps, disconnect pipe leading to each trap and allow steam to flow freely. Then check temperature of platens. The trap may not be large enough to handle the number of presses to which it is connected.
7. Whenever a thermometer or pyrometer is available, use to determine exact temperature of platens.

Constantly checking for correct steam pressure and mold temperature, is an assurance of more uniform Bakelite Molded parts. Write for Booklet 51M "Bakelite Molded."

Reading steam gauge to check against boiler pressure

Thermometer test of mold temperature

This advertisement is the second of a series in which we are featuring a few fundamental rules of plastic molding. Although obvious to many, we find they are frequently overlooked resulting in a loss of both time and money to the molder.

By calling attention to some of these simple rudiments Bakelite Corporation hopes to give its customers the benefit of its long experience in its endeavor to advance the art of plastic molding.

These advertisements have been designed so that they can be placed on the bulletin boards in your Molding Rooms. Extra copies may be had upon request.

BAKELITE CORPORATION
247 Park Avenue, New York, N. Y. Chicago Office: 635 West 22nd Street
BAKELITE CORPORATION OF CANADA, LTD., 163 Dufferin St., Toronto, Ontario.

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Karolith Corporation, 2125-44th Road, Long Island City, N. Y.

PLASTICS, Vol. IV, No. 10, October, 1928. Publication office, 49 E. Washington Avenue, Washington, N. J. Executive office, 114 E. 32nd Street, New York City, N. Y., by The Plastics Publications, Inc., R. C. Gilmore, Jr., President. Subscription price, Domestic $3.00 per year, 35c per copy. Foreign and Canada, $4.00 per year. Entered as second-class mail at the Post Office at Washington, N. J., under the act of March, 1879, and copyright, 1928, by The Plastics Publications, Inc.

Predominance in the automotive industry offers a sure guide for *any* industry

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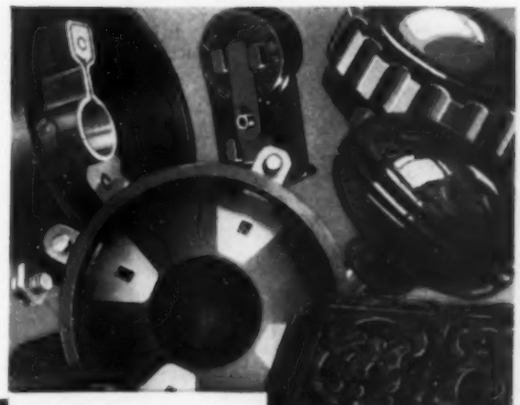

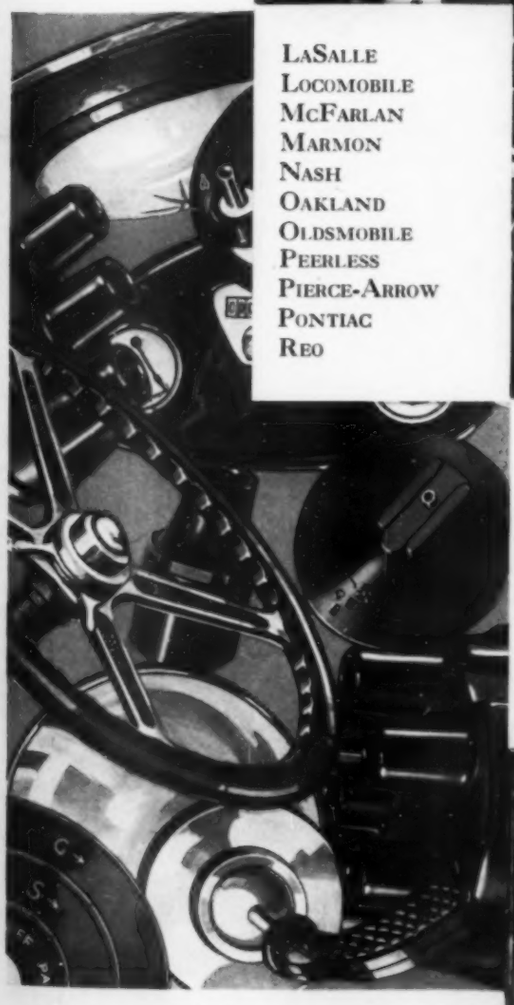

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and more than eighty trucks, tractors and marine craft carry equipment made of DUREZ

Send for this interesting booklet
"DO IT WITH DUREZ"
Contains a wealth of information

DUREZ—the perfect plastic!—enters into the construction or equipment of more automobiles than all other molding compounds combined!

In an industry so fraught with competition of the keenest sort, the adoption of a material or part is no random procedure. The meticulous analyses of research staffs, the racking tests of private proving grounds, the close specifications of the automotive engineer, production schedules calling for speed and economy—all these must be met with absolute certainty.

As a material for molded parts Durez has won by a decisive margin. In some instances possibly because of its greater impact strength. Or its fine appearance. Or its ready workability. Or the uniform toughness, hardness and perfect form with which it comes from the mold. Or the elimination of expensive hand-tooling and burnishing which it enables. Or the splendid dielectric properties it possesses. Or because of its marvelous heat, moisture and oil resistance. . . . But more likely it is because Durez so thoroughly combines *all* the qualities of a perfect molding compound.

The great preference for Durez in an industry calling for such a wide range of diversified parts and applications as the automotive industry, is a reliable guide for *any* industry.

We commend Durez to your earnest consideration. We make Durez molding compound for general or special requirements; and in every practical color. We offer you the cheerful assistance of our laboratory and engineering staff. We will gladly send you complete data regarding this marvelous plastic. Why not investigate the possibilities of Durez toward your own requirements?

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in United States

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An Analysis of the Technique of Moulding Thermo Plastic Materials

75%--Burroughs Equipment
15%--Proper Material
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Established 1869

248 NORTH TENTH STREET NEWARK, N. J.

BUILDERS OF HYDRAULIC MACHINERY FOR ALL PURPOSES

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OUR roving eye discovered some words in Printer's Ink for October 4th that should be read by everybody in the Plastic field. We reproduce it herewith, calling special attention to the last paragraph.

"There are manufacturers who whisper behind closed doors while formulating their plans and then send them in printed form to salesmen, jobbers and dealers. But they are still considered to be secrets to be kept from competitors.

Any competitor who really wanted to know could get the complete story easily enough; just as any clever spy can the secrets of Governments.

Business will always have some secrets but those that are guarded most closely are usually common knowledge."

And now for the molders: your business is just recovering from a slump that you have blamed on several causes,—molders as a whole, that is, not one or two "big ones". We print herewith a "cause and effect" diagram for your study:

Molders' Knowledge + Secrets and Competion

+ New small concerns

+ more secrets

+ more business

over smaller area =

Loss of profit

Some of you are indifferent because your "secrets" are not yet known and you still have your profit; some of you are discouraged because of unethical methods on the part of your competitors; some are so nearly out of business that you measure in units instead of volume; And *all* of you are looking for a remedy: Consolidate your opinions, your secrets and your interests and watch the outcome!

The Publishers.

PLASTICS
& MOLDED PRODUCTS

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Vol. 4 OCTOBER, 1928 No. 10

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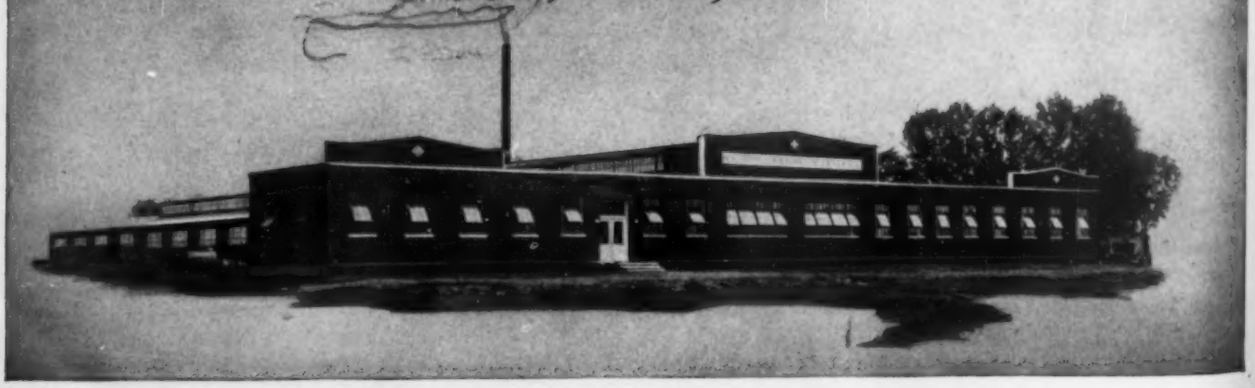

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PLASTICS

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Vol. 4 OCTOBER 1928 No. 10

Nature's Natural Glass—Mica—Forms Basis of Important Composite Molded Products

Manufacture of heat-resistant and highly insulating articles from mica sheets and flakes is an important branch of the plastic industry

By Joseph Rossman

Mica, most familiar to the layman in the form of fireproof windows used on the old-fashioned parlor stove, has always formed an important part in electrical apparatus. In combination with thermo—plastic materials it forms the basis of insulation in motors, dynamos and other electrical goods. The manufacture of these articles as based on the United States patent art is the subject of the present article—another one in our series of plastic arts bringing to our readers the history of each art from its inception.

MICA sheets have been long recognized as an excellent electrical insulator. Mica has great mechanical strength, high insulating and heat resisting properties. It is especially valuable in building up commutators. At first large mica sheets as obtained in natural state from the mineral were used for the purpose of electrically insulating electrical conductors, as, for example, the laminae of field magnets, the grooves in armature cores, commutators, armatures, and other elements employed in manufacturing electrical machinery and instruments. Difficulties were met in view of the expense of large sheets of mica. Owing to the progress made in the electrical industry, such large quantities of mica now used that the material is not only progressively rising in price, but it cannot be found in sufficient quantity in pieces of a sufficiently large size, since in the natural condition mica very seldom occurs in large formed masses compared with the quantity found of a smaller form.

This had led to the manufacture of composite mica, sheets from mica waste, flake mica, split mica, mica powder and the like, these materials being far cheaper than the natural mica. The process for producing mica sheets was discovered in an early patent number 389,519 to Charles T. Lee granted in September 11, 1888. The composition consists of mica comminuted so as to form scales or laminae, varying in size from very small fragments to pieces one-eighth or one-quarter of an inch, or even larger, mixed with shellac in the proportion of about sixty-five parts of mica, by weight, to thirty-five parts of shellac. The mica is incorporated with the shellac by the aid of heat which softens the shellac, after which any suitable method of mixing the substances may be employed. They are properly mixed by means of a friction-roll mixer consisting of a pair of heated rolls, one roll running at about one-third greater speed than the other roll. The pieces of shellac and mica are mixed and thrown together onto the hot rolls, which revolve side by side and may be adjusted relatively to each other, and as the mixture passes through into a trough or receiver placed underneath it is again put onto the rolls, and this working is continued until it becomes a plastic mass, when

it will adhere to one of the rolls, whence it is skived off with the aid of a knife and laid aside in a flat sheet. To prepare these sheets for molding, in case they are allowed to cool, the sheets are placed on a steam table, and heated until they become plastic and workable again, after which the sheets, or parts of them, of a proper size, are put into hot molds, molded under pressure, and allowed to cool. Such a composition will take a clear and fine impression in the molds, is comparatively light, very strong and durable, and may be used for a great variety of purposes. In mixing the mica and shellac to form a sheet of composition, the laminae of mica tend to a parallel position, and as they overlap and interlock the breaking strength of the composition is very much greater than that of compositions in which laminated material is not used. In case the composition is to be molded, it will be found very desirable to use either shellac alone or a considerable quantity of shellac combined with other resinous gum.

Building Up Sheets

Another process which has been widely used is disclosed by Dyer in patent No. 483,646 October 4, 1892. A plate of soapstoned sheet-iron forming a table is used upon which the artificial sheet is composed. It is necessary that the product or sheet formed finally by the process should be easily removed from the iron table. This is the reason why the table is rubbed with soapstone, which allows the mica sheet or plate when formed to be split or scaled off from the iron table. The scales, circular, oval, or elliptical, as obtained from the trimmed waste are indiscriminately placed upon the iron, which has a coating of fresh varnish, in such a manner that the edges of the various scales overlap each other. When a sufficient area of the iron is covered, a second layer or laminae is formed in the same manner, the first layer having first been coated with varnish, shellac or similar insulating coating. Upon the second layer a third laminae is formed, as before, and the number of laminae is increased until a sufficient thickness for the purpose intended is obtained. While the sheet is still wet with the adhesive liquid, it is dried by heat, as by laying it on a steam-table. By this step the alcohol of the dissolved shellac or the oil and turpentine of the varnish are partially evaporated. The sheet is then rolled between the rollers to expel the varnish from between the plates, except as to what will naturally be left in consequence of adhesion. Subsequently and before the sheet is hardened it is subjected to a very heavy pressure. By placing it upon a cold plate it is chilled and hardened, and finally sawed into the desired shapes and sizes. It is of such a nature that it can be milled or planed, whereby it is reduced to uniform thickness.

By this process mica sheets of any size can be produced. In working insulating bushings, thimbles, etc. it is necessary to employ sheets of material of greater area, thickness, cohesion and pliability that can be found in nature. The natural laminae of mica are of limited size and the masses thereof, of whatever thickness, tend to separate along their lines of cleavage into their constituent plates, flakes or laminae, so that a sheet of mica, even if it can be obtained in its natural form of a sufficient area and thickness, which is unusual, is not sufficiently pliable, and has not sufficient cohesion along its lines of cleavage, to enable the same to be shaped or molded in the desired manner. The value of composite mica sheets can thus be readily appreciated.

Hand Work

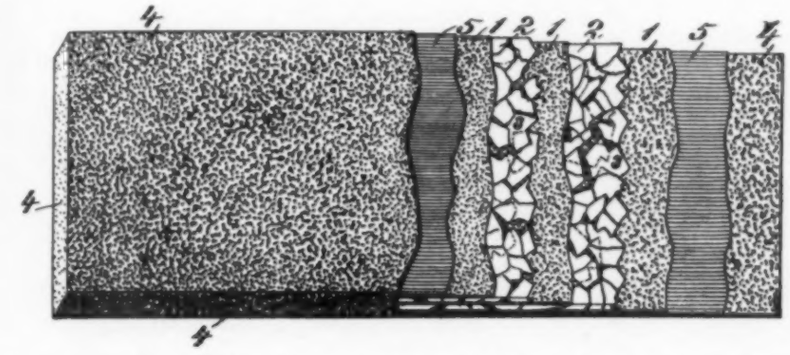
For a long time these composite sheets have been made by hand, usually by girls who use a suitable frame or tray having a bottom of wire gauze upon which the plates or flakes of mica are laid in successive layers with the interposition, from time to time, of a suitable amount of shellac binder, manually applied to the flakes, this operation being continued until a sheet of the desired thickness has been built up, the frame being held before or over a suitable light for the assistance of the girl in keeping the sheet of an approximately even thickness. This operation is slow and laborious, the quality of the product depending largely upon the care and skill of the individual operators, and it being practically impossible to form a sheet having straight, square edges of the same even thickness and cohesion as the remainder of the sheet. This is due to the fact that the binder is applied by hand to the plates after they are laid in the tray, and this binder is not thoroughly worked into the interstices between the plates at the edge and corners of the tray so that the resultant sheets are characterized by a lack of adequate adhesion between the constituent plates at these points. With a view to decreasing the time and labor involved in the manufacture of these sheets, it has been proposed to shower the plates or flakes upon the trays, attempting in this way to spread them evenly, until they have been deposited thereon to a sufficient depth, and thereafter to attempt to force the binder into the spaces between them under pressure or by means of a vacuum.

Dropping Through Towers

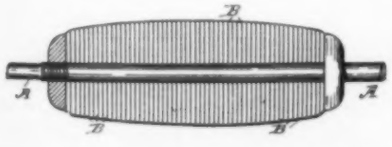
A successful method of building mica insulating material that has been employed consists in feeding measured amounts of mica flakes and powdered binding material into the top of a relatively high tower, and allowing the mingled flakes and binder to distribute themselves over the surface of a plate or box which forms the bottom of the tower. When sufficient material has been deposited in the receiving box to form a finished plate of the de-

sired thickness, the box carrying the assembled mica and binder is removed from the tower and the material is afterward subjected to heat and pressure in order to melt the binder and cause the mica flakes to adhere firmly together.

The McCarthy patent No. 1,622,796 March 29, 1927 states that it has been found that by showering the plates or flakes from a considerable height, preferably from a foraminous container, such as a rotating drum, upon a suitable extended substantially plane surface, spreading the liquid binder upon the plates or flakes on said surface as the showering operation progresses, and rolling the whole, said binder will be caused to penetrate the interstices between the superimposed and interlocked plates or flakes, and a sheet of substantially constant thickness, great tenacity, and uniform dielectric property will be produced. Also, by relatively moving the surface and the drum or other container from which the plates or flakes are showered, it will be seen that a sheet of an area limited only by the area of said surface and the amount of relative movement may be made.



U. S. P. 687531, (1901) shows a number of different layers of mica pieces united by intervening plastic material.



Molded handle for vessels and tools made of formed mica, (U. S. P. 433284)

The molding of mica for electrical insulators has presented many difficulties. In order to provide flanged insulator rings of such material, it has been proposed in patent No. 483,653 October 4, 1892 to form such rings by making an annular disk of such built-up mica and by means of a suitable mold pressing such annular disk into the shape of a flanged ring, or, in other words, building a mica sheet by cementing together laminae of mica scales with overlapping edges, compressing the sheet into the desired form while the cement is wet, drying the cement by evaporating the solvent thereof, and finally chilling the molded mica sheet while under compression. The difficulty with and objection to this method are that mica scales being very brittle and unyielding, and being connected together with overlapping edges by the cement will move apart and get out of place when pressure is appied with a mold and cannot be uniformly bent into the irregular shape and flanged when desired without either breaking or being separated from their built-up position, thereby leaving seams and cracks and not affording a solid flanged ring in one piece.

Peterson, patent No. 549,254 November 5, 1895 molds insulators as follows: Pieces or scales of mica are built up by hand and assembled over a mold into the desired shape, the pieces being cemented together by gum-shellac or other suitable binding medium and conforming to the curved parts and other irregular portions of the mold. The ring so formed is then placed in a suitable press conforming to the shape of the ring and pressure and heat are applied, the cement becoming dried and fixed and the ring cooled in the well-known way in this art.

Composite Plates

A composite mica plate has recently gone into considerable use. The composite mica sheets have for many years been made by the use of a binder of natural gum, such as shellac or copal. Attempts have been made from time to time to use other binders but none have proved as suitable as shellac. However, shellac softens at comparatively low temperature (about 65 to 70°C.) and decomposes as the temperature increases, decomposition setting in rapidly between 175 and 200°C., hence, certain disadvantages accompany its use. In assembly operations of commutators, temperatures as high as 300 to 350°C. may be reached, for instance, when commutators are immersed in molten tin during the "tinning" operation. Thus mica plates and cones used in commutator construction may be subjected to temperatures sufficiently high to cause the shellac to ooze out from the mica composition between the copper segments. At higher temperatures this escaped shellac when carbonized or decomposed may cause short circuits. When not

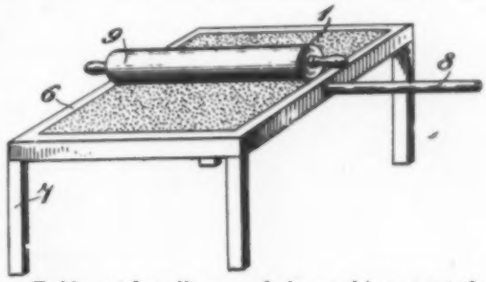


Table and roller used in making pasted mica sheets (U. S. P. 687531)

(*Continued on page 562*)

Continuous Process for Making Phenolic Resins Aims at Production of a Uniform Product

Counter-current system making use of the heat of reaction recently patented

IN contrast to the usual batch method of preparing phenol resinoids, the process about to be described makes a continuous operation of the condensation, the reaction being started in a mixing tank and continued and controlled while the fluid reaction-mixture is gradually passed through a coil of pipe immersed in an oil bath.

According to the inventor, Victor H. Turkington, as described in his patent, an apparatus of the type diagramatically illustrated in the sketch below, may be used.

Referring to said drawing, 1 indicates a mixing tank mounted on a scale 2 and provided with a mixing agitator 3. The phenol and aqueous formaldehyde, or their equivalents, are charged into this tank and thoroughly mixed, the catalyst, if such is used, being also added at this point. The reaction mixture is fed to a pump 4, preferably a steam piston pump capable of producing a pressure of the order of 100-500 pounds per square inch.

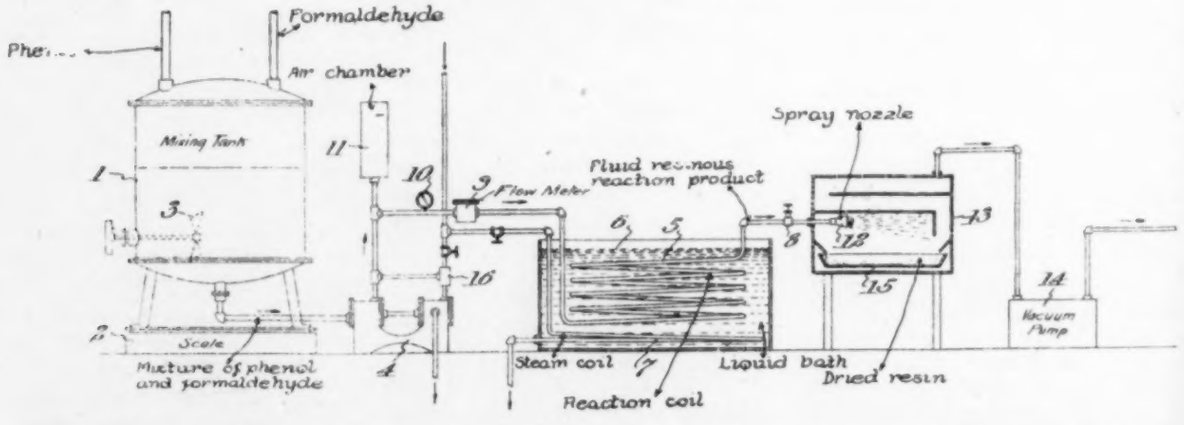
MANY have been the proposals aimed at the proper control of the condensation reaction between the phenols and aldehydes. The novelty in the process described here lies in the continuity of the operation. Phenol and an aldehyde is mixed, the reaction is initiated by the addition of a suitable catalyst and heating, whereupon the entire mixture is passed through a coil immersed in an oil bath that is also somewhat heated, although the heat of the reaction is depended upon to keep the process going. The resin produced is then dehydrated by spraying it into a vaccum chamber to remove excess formaldehyde and water.

The process is the invention of Victor H. Turkington, U. S. Patent 1,660,403; Feb. 28, 1928; and is assigned to the Bakelite Corporation.

The pressure is maintained constant at the desired value by means of an adjustable pressure regulator installed in a by-pass connecting the steam supply line to the pump discharge line. From the pump the reaction mixture passes through the reaction coil 5, formed of extra heavy iron or copper tubing immersed in a bath 6 of oil or other suitable liquid of high boiling point. 7 represents a closed steam coil, supplied with steam at about 125 pounds pressure, and used for heating the oil bath 6 to initiate the reaction. This coil may also be supplied with water connections for cooling the bath, should this be required. This reaction is strongly exothermic, and the heat of reaction will ordinarily suffice to maintain the proper temperature of the oil bath, provided the operation is carried out on a sufficient scale.

Forward Flow of Material

The reaction mixture is forced slowly through the coil 5, the rate of flow being controlled by a needle valve 8 and measured by a recording flow-meter 9. 10 represents a pressure gauge, and 11 an air chamber on the discharge line of pump 4. The regulation of the flow, and of the temperature of the bath 6, is such that the reaction is com-



Apparatus described by the inventor and used for producing a phenol resin in a continuous operation.

pleted to the desired point when the reaction mixture reaches the discharge end of the coil 5. It will be apparent that the maximum rate of flow will depend largely on the length of this coil.

The reaction mixture in the coil is now a fluid resinous mass containing a large proportion of water, in case aqueous formaldehyde was supplied to the mixing tank 1. This mixture is sprayed by a spray-nozzle 12, into a vacuum chamber 13, in which a relatively high vacuum is maintained by a vacuum pump 14. The resin is collected in a pan 15 from which it may be withdrawn continuously or from time to time. In practice two vacuum chambers are provided, used alternately, thereby avoiding interruption of the operation.

Spray-drying the Product

When the highly heated and fully reacted mixture is sprayed into the vacuum chamber the water is instantly removed as vapor, and the resin is at the same time cooled to 50° C. or less, which is below the temperature at which the reaction proceeds at an appreciable rate. If desired the vacuum chamber may be water-jacketed to promote this cooling. Thereby two important results are achieved, namely the water is quickly removed; and the reaction is checked almost instantly and at exactly the right point. In this way a most efficacious control of the entire process is secured.

In case the resin is of the permanently fusible or non-reactive type (such as results, for example, when 100 parts of phenol are reached with 70 parts or less of 40% formaldehyde without a catalyst or with an acid catalyst) the operation is very simple and special precautions are not required to prevent the reaction from proceeding too far. However, if the resin is of the reactive type (such as results for example when 90 to 100 parts of phenol, especially with a basic catalyst) it is essential to maintain a very close control to avoid possibility of formation of an infusible resin. In such cases I prefer to start the system in operation using such phenol-formaldehyde ratio as will produce a permanently fusible resin, and to increase this ratio, and to provide the conditions for making the reactive resin, only after the conditions of temperature equilibrium and rate of flow have been fully established.

With regard to the advantages of this type of operation, it may be pointed out that the present practice employs digesters or stills having a capacity of several thousand pounds. In such large masses very careful control of the reaction is required, and an accident to the cooling-water supply, for example, might entail the setting of the entire mass into an infusible resin, resulting not only in the loss of the materials but keeping the unit out of production for considerable periods. It is also difficult to effect such control of these large masses as will produce a strictly uniform finished product.

Advantages

In the continuous operation only a small quantity of material is in process at a given time, and even in the event that the resin should reach the infusible condition in the coil, this latter may be quickly replaced. There is however little danger of this, since the reaction can be very accurately controlled, and all conditions of mix proportions, rate of flow, pressure, temperature, etc., can be definitely established and continuously maintained to produce in uniform quality the desired grade of finished product, whether of the reactive or non-reactive type. The continuous operation also effects some saving of steam and cooling water, due to the fact that little of either is required after the process is once in operation, owing to the fact that the heat of reaction is transferred to the oil bath 6 and thereby utilized to preheat the mixture to the reacting temperature. Furthermore a large production can be obtained from a single unit with a minimum of labor and supervision.

The invention is applicable broadly to phenolic resins of every type, irrespective of the particular phenol or phenolic body employed, or of the nature of the aldehyde or methylene-containing reagent used therewith. Materials other than high-boiling oils may of course be used for the bath 6, and any appropriate means may be provided for heating or cooling this bath. For example, a thermostatic temperature control may be applied at this point.

Appeal From Bakelite Decision

Washington, Oct. 9—Much interest centers in the appeal taken by Bakelite Corp. to the U. S. Supreme Court from a decision of the Court of Customs Appeals in which the latter assumed jurisdiction over a case passed upon by the Tariff Commission involving alleged unfair practices which the commission had held were within the scope of section 316 of the Tariff Act. The heart of this controversy is whether or not the commission has authority over patent rights under the Unfair Practices Act.

The Supreme Court yesterday granted a petition for a review of the case and set it for argument the latter part of October.

Bakelite Corp. and several other manufacturing concerns two years ago appealed to the Tariff Commission against importations from Czechoslovakia of articles made of synthetic phenolic resin, principally cigarette and cigar holders, alleging its patents were infringed upon by the imported articles.

The commission conducted an investigation under section 316 of the 1922 Tariff Act, held that it had jurisdiction over unfair practices involving patents in such circumstances, and recommended to the President that an embargo be placed against such imported goods.

The embargo was issued through the Secretary of the Treasury, and the importers appealed to the Court of Customs Appeals. Bakelite Corporation argued that the court had no jurisdiction, but the Customs Court assumed jurisdiction under sub-section C of section 316, which provides that an appeal may be taken to the Court of Customs Appeals upon questions of law only.

It is from this assumption of jurisdiction that the appeal to the Supreme Court has been taken, and the case will open the way, if the high court decides to go into the matter, to decide the fundamental question of whether or not the Tariff Commission has jurisdiction of patent cases involving imports, or whether the remedy of the patent owner rests alone in the U. S. District courts.

How Changes in Style and Design of Radio Apparatus May Affect the Plastics Industries

Metallic panels and cabinets, internal dials and strips instead of sockets, have made inroads into demand for molded parts

By Carl Marx

ONLY a few short years ago by far the largest part of a radio set consisted of plastic material, mainly in the form of dials, panels condenser supports and tube-sockets.

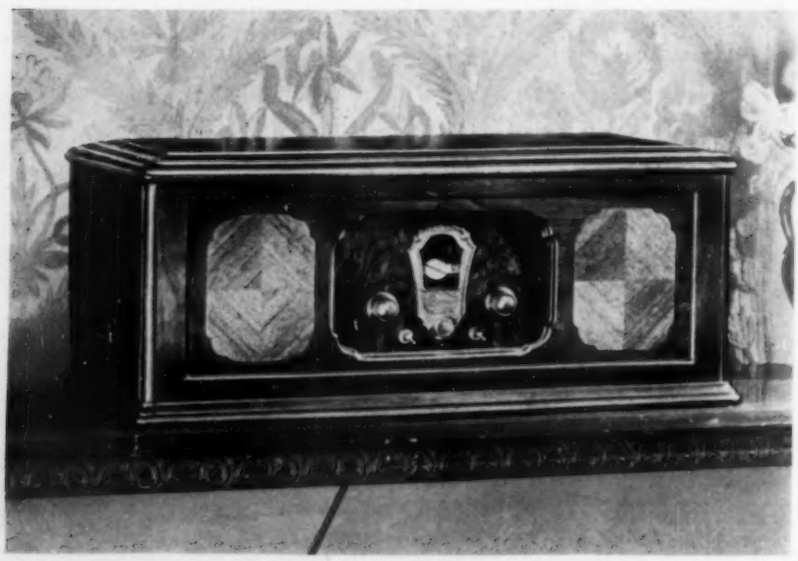
A visit to the Radio Show recently held at Madison Square Garden at New York discloses a remarkable change in this respect. The phenol-resin front panels, with their assembly of knobs, dials and other molded gadgets have completely disappeared, and without exception the front of the modern sets consists either of highly finished wood, or of metal, although a few wood-veneered metal panels were exhibited.

Dials Now Inside

With the exception of the Atwater-Kent receivers, in which the full-vision molded resinoid dial has been retained more as a sort of trade-mark, all of the present-day receivers favor the concealed type of dial, either in the drum or disc form, many of them with means for direct or indirect lighting. This change in the equipment of radio receivers has cut off a large demand for custom-molded equipment.

However, there are compensations. In place of the single tube, or at most three-tube receivers of the past, the all-electric sets in vogue today invariably consist of from six to nine tubes, and the sockets have in most cases been replaced by properly perforated strips of laminated materials. Whatever was lost in the case of laminated panels has more than been made up by the extensive use of subpanels within the set, and the tube-socket-strips.

Another startling change is the total absence of the showing of any storage batteries. It would almost seem as though these have completely disappeared, and the manufacturers of several well-known brands of storage batteries have gone into the manufacture of complete alternating - current operated sets. A similar thing has happened to the dry-cell business. As characteristic of the trend, it might be mentioned that the National Carbon Company, the largest producer of dry A and B Batteries for radio use, have likewise entered the field of A-C current operated receivers.



The modern Radio Receiver is quite devoid of the multitudinous dials, knobs and gimcracks that once adorned its panels.

Batteries Have Gone

While the demand for automobile storage batteries is on the increase, the loss of the radio wet-battery business is bound to affect the manufacture of molded battery containers. During the past few years the number of patents on the production of these containers has been very numerous, but a falling off of the demand for them will probably result in a virtual discontinuance of this intensive work on new battery compositions and methods of molding the cases.

Fortunately, the bases of all the modern alternating current electron-discharge tubes are still made of molded materials, and a large demand is assured.

New Uses

There were several displays, however, that are of considerable interest in connection with molded products. For example, the Micarta Fabricators (Westinghouse Electric and Mfg. Co.) showed a fine line of laboratory accessories made up of laminated sheet stock and rods. Test tube holders, beaker supports and the like formed part of the display. Another important new use for laminated phenolic material shown by these exhibitors is the production of molded trays, such as may be used in hospitals for serving food, bandaging and

(*Continued on page 566*)

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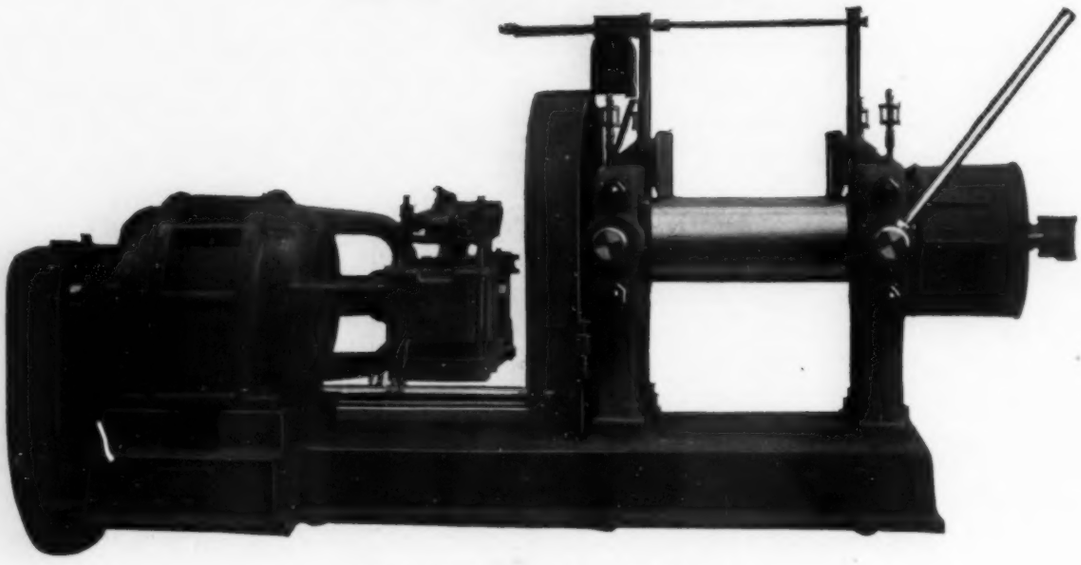

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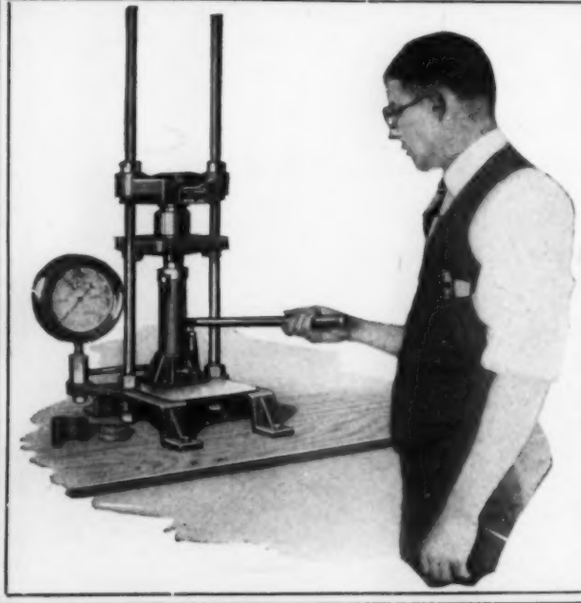

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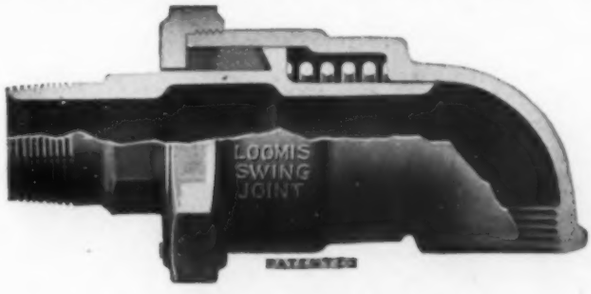

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Phenol Not An Essential in Resinoid Production---Use of Furfural Alone Leads To Valuable Material

Furfuralcohol forms basis of a valuable substance when heated with acids

The advent of comparatively cheap furfural and the rapid expansion of its utilization together with constantly increasing production of this material and the discovery of new sources of supply makes the process described herein of particularly timely interest.

Furfural resins that result from the condensation of furfural with the phenols have been described many times, and even at the present time research on these interesting and potentially valuable resinous materials is going on apace.

The efforts of the research workers, Miner, Trickey and Brownlee, to whom the credit for the achievement of commercial furfural in car-load lots instead of as a chemical curiosity is due, have also been directed along the lines of furfural resins, so that an increased demand for the furfural might be created. In the course of this systematic research, a number of discoveries were made. Among these is a potentially reactive resin that is made from a furfural derivative alone, without the intervention of any phenolic body. The work leading to this product was commenced more than five years ago, but the patent covering the same was only granted last April, as U. S. P. 1,665,235; April 10, 1928, application having been filed May 31, 1924. The inventors, John P. Trickey and Carl S. Miner, have assigned the patent to the Quaker Oats Co., from whose oat-hulls and in whose Cedar Rapids, Ia., plant the present supply of commercial furfural is produced.

Use Furfuralcohol

According to this invention furfuralcohol is condensed by heating it together with a suitable catalyst. The following description of the process is based on the disclosure in the patent under discussion.

"Contrary to all previous chemical experiences with the alcohols, we have discovered that under properly controlled conditions certain reactions will take place in alcoholic furane derivatives such as furfuralcohol, and that materials in the nature of resins result from a transformation of the alcohol. We have discovered that such reactions may be made to take place by several different methods. For example, furfuralcohol by itself may be continuously heated for a long period of time and the reaction will then be manifested by the formation of small amounts of the resinous material.

Condensation

"Furthermore, furfuralcohol may be allowed to stand without heating for a considerable time in the presence of a suitable catalyst and the reaction will also manifest itself by at least a small amount of resinification. We have discovered, however, that alcoholic furane derivatives, such as furfuralcohol, when heated in the presence of various catalyst are transformable into resinous material much more quickly than with the independent use of heat or a catalyst. A wide range of catalysts may be used and when the reaction is properly controlled, resins of various desirable physical properties are obtainable.

"For example, we may add one-tenth of one percent (.1%) of hydrochloric acid to a quantity of furfuralcohol while heating the mixture to a temperature approximating 80° C. If this quantity of acid catalyst is added to the alcohol at room temperature, the reaction will take place only very slowly, and the alcohol will become completely transformed into a resinous material only after standing for a long period of time. However, if the addition of the catalyst is accompanied by heating of the mixture, the reaction will proceed much faster, in fact, the speed and extent to which the reaction proceeds may be largely controlled as desired by properly regulating the temperature. The reaction, being exothermic in character, will proceed of itself after the mixture is heated to approximately 80° C. If the reaction takes place in a large volume of the mixture, the heat resulting from the reaction may sometimes be excessive and thus may cause the reaction to proceed too rapidly and to become difficult to control. Accordingly, in treating large volumes of the mixture, as soon as the reaction starts, we proceed to control the temperature by applications of a cooling medium. We have found it desirable, with large volumes to maintain the temperature at about 110° C. or less. This temperature may be maintained, for example, by the

(*Continued on page 570*)

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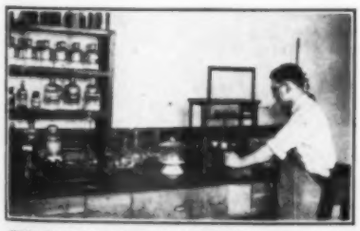
ALIKE AS TWO PEAS—to the naked eye, perhaps. But the microscope detects things about the physical nature of the basic materials used in Celoron, that may mean the saving of thousands of dollars to Celoron users.



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Standard Methods of Testing Insulating Materials

Latest revised specifications for determining the physical properties of molded products, as set forth by the

American Society for Testing Materials

Schedule Serial Designation: D 48-27[1]

By the kind permission of the American Society for testing materials, 1315 Spruce St., Philadelphia, Pa., we are enable to answer a number of readers simultaneously as to the accepted methods for testing molded insulation.

THE accepted American methods for the testing of electrical insulation are those herein recited. All high grade material must conform to definite standards The methods at present in use are as follows:—

Scope

1. These tests are intended to apply to all solid insulating materials that are formed in molds by the application of pressure, either with or without heat.

Tensile Strength

Apparatus

2. Any standard testing machine may be used provided the error in the loading range does not exceed 1 per cent. Special clips (see Fig. 1) of hardened steel shall be used, hung from links held in the jaws of the machine, so that the pull is central at all times, to avoid any transverse strain.

Specimen

3. The standard test specimen shown in Fig. 1 shall be used for the tension test. It shall be molded to the dimensions shown in Fig. 1.

Method

4. (*a*) Five specimens shall be tested in the condition in which they are received.

(*b*) The speed of the head of the testing machine shall be such that the load can be accurately weighed but shall not exceed 0.050 in. (1.27 mm.) per minute with the machine running idle. All tests shall be made at normal room temperature of about 20° C. (68° F.). Measurements may be taken at intervals during the test to show the elongation of the specimen when required for elastic materials.

[1]These methods are issued under the fixed designation D 48; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

ISSUED AS TENTATIVE, 1917; ADOPTED IN AMENDED FORM, 1922; REVISED, 1924, 1927.

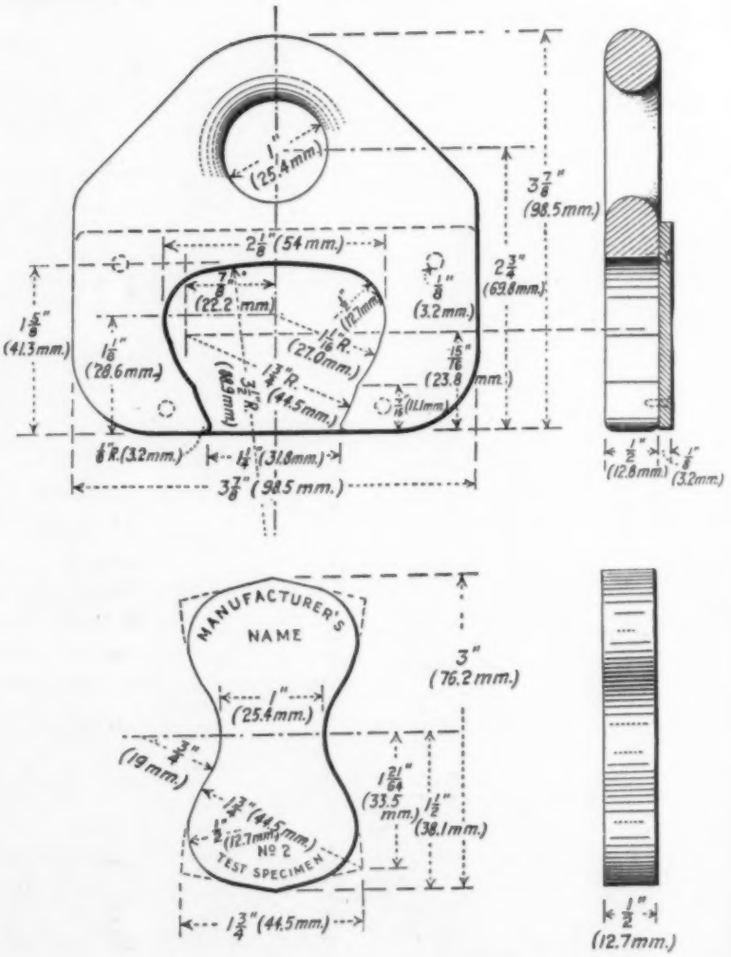

Fig. 1.—Tension Test Specimen (Specimen No. 2).

Report

5. The report shall include the following:

(*a*) The breaking load of each specimen in pounds or kilograms;

(*b*) The thickness of each specimen in inches or millimeters as measured by a micrometer at the center of the specimen, that is, the point of minimum section;

(*c*) The ultimate tensile strength in pounds per square inch or in kilograms per square millimeter of each specimen, calculated from the minimum area measured at the center of the test specimen before the load is applied;

(*d*) The character of the material tested, with description of how it acts under stress;

(*e*) The speed in inches or millimeters per minute at which the jaws traveled during the test.

Compressive Strength

Apparatus

6. Any standard testing machine may be used provided it is accurate to within 1 per cent

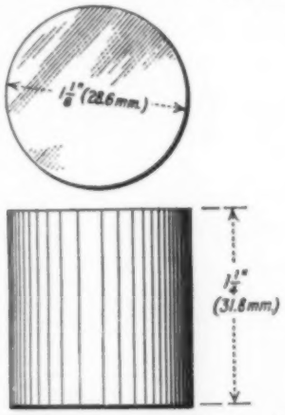

Fig. 2.—Compression Test Specimen (Specimen No. 3).

of the lowest load for which it is used. One end of the specimen shall bear upon an accurately centered spherical bearing

(*Continued on page 572*)

[1]Under the standardization procedure of the Society, these methods are under the jurisdiction of the A.S.T.M. Committee D-9 on Electrical Insulating Materials. In using these methods, reference should always be made to any pending revisions affecting the methods. For high-frequency tests, see the Tentative Methods of Testing Electrical Insulating Materials for Power Factor and Dielectric Constant at Frequencies of 100 to 1500 Kilocycles (D 150-27 T); and the Tentative Method of Testing Electrical Insulating Materials for Voltage Effects at Radio Frequencies (D 175-25 T) of the American Society for Testing Materials, **Proceedings**, Am. Soc. Testing Mats., Vol. 27, Part I (1927); also 1927 Book of A.S.T.M. Tentative Standards.

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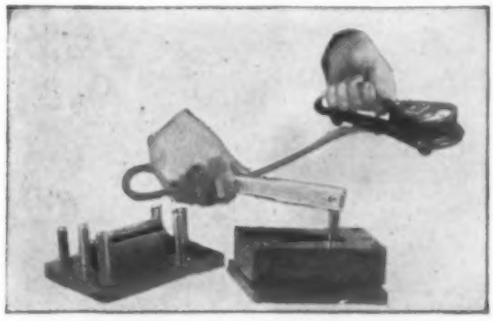

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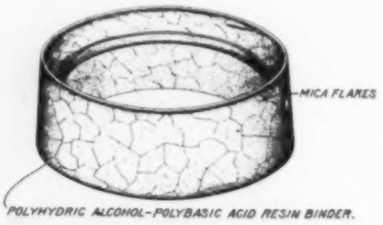
Fabrication of Mica Articles by a Form of Plastic Molding

(*Continued from page 551*)

actually carbonized partial decomposition of the shellac will yield decomposition products through destructive distillations which are deposited upon the various parts of the commutator and which are not only conductive in themselves but attack the copper and form additional deleterious non-insulating substances. Even when the shellac does not escape, its softening will cause sliding of the mica plates when under pressure. In commutator construction, this displacement of the mica plates will leave the commutator bars loose. It has been attempted to overcome these difficulties by using a phenolic condensation product as a binder for composite mica articles but it was found this material would not adhere to mica with sufficient tenacity nor bond mica plates together sufficiently well to form an adequately dense and strong insulation. Phenolic condensation products also carbonize rather readily. Barringer and Peterson in a recent patent No. 1,589,094 June 15, 1926 state that esters of polyhydric alcohols fulfill all of the exacting conditions requisite for a bonding agent in mica compositions, both in physical and electrical properties and adhere with such tenacity to mica that cemented mica articles formed thereby ring when struck, as though made of steel, while at the same time being sufficiently thermoplastic even when fully cured to yield somewhat at high temperatures so as to be moldable sufficiently to permit some shaping of the mica articles during assembly as parts of electrical machinery or other structures. In this material the cement or binder is a resin of the polyhydric alcohol-polybasic acid type. This material is superior to the older mica plate principally in that the binder distributed throughout the laminations of the composite material has electric insulating properties greater than those of shellac, in that its products of combustion also have superior insulating properties to those of the products of combustion of shellac, and in that the binder will withstand a higher temperature than shellac before it begins to deteriorate.



Type of insulating ring described in U. S. P. 1,589,094.

Making the Resin

The process is described as follows: The reaction product of glycerine and phthalic anhydrid described in Callahan patent No. 1,108,329 in the soluble fusible condition characteristic of the first stage of the reaction is preferably used. Conveniently the ester is applied as an acetone solution to the surface of the mica plates and is drawn in between the laps of the mica flakes by capillary force. In some cases the mica plates are built by superimposing dry mica flakes to the required thickness without a binder. The binder then is introduced in solution between the laminae by immersing the plates in the solution, thus depending entirely on the capillary force to distribute the binder. In the manufacture of built-up mica articles as for example, commutator cones, a stack of sheet material is first made as above described. After evaporation of the acetone solvent this sheet material is heated in a press to a temperature of approximately 175°C. At this temperature reaction takes place in the glycerine ester, as described in the patents No. 1,108,329 and No. 1,108,330 which if continued will result in the ester becoming hard, non-fusible and insoluble. As it is not desired that the ester assume the non-fusible state before the article of mica has been shaped, the heating is discontinued while the binder is still in an intermediate thermoplastic state. In this condition the plate is subjected to machining operations to preform blanks or developed shapes of the mica articles which we may desire to make. These developed shapes are then formed and put into moulds which have been heated to 250°C., and at once put in a press which presses the mica into its final form. The moulds and mica compositions are then taken out of the press and placed in an oven maintained at about 300°C. for sufficient length of time to polymerize the binder. No hard and fast molding and polymerizing temperatures for preforming and for polymerizing can be given which will apply to all cases. However, the temperature range in general varies within 100 to 300°C., the lower temperatures of this range being adapted for the preliminary curing and the higher temperatures for the final hardening operation. The moulds are then taken out, again placed in a press and held under pressure until cooled off either by the natural loss of heat or by artificial cooling.

A more recent patent No. 1,645,415 October 11, 1927, to Coffey uses a resin resulting from the condensation reaction of glycerol and phenol as a binder for the mica plates.

The following abstracts give a review of the U. S. patents which disclose processes for making composite mica sheets.

1. Snare 56,625 July 24, 1866.

The invention consists in a compound fabric formed by the union of thin laminae of mica with layers of paper, cloth, silk, leather, or similar flexible materials, said layers sustaining the laminae of mica, and the mica rendering said fabric water-proof and non-conducting, so that said fabric can be used in wearing apparel for keeping out moisture, for retaining heat of the body, and for withstanding external heat. Cement or varnish of any desired kind is used, such as dextrine, starch, flour paste, glue, gum-arabic, gum-tragacanth, solutions of india rubber and gutta-percha; also compound cements, such as flour paste with glue and flour paste with gum-arabic.

2. Torrey 137,509, April 1, 1873.

In carrying out the invention the vulcanizing compound of gum and sulphur is prepared in the usual manner for the purpose for which it is intended. Mica in dust, powder, or in scales is incorporated with the mass and the whole vulcanized together. Instead of using raw rubber, gutta-percha, or other gums, waste rubber, asphaltum, tar, shellac, linseed, and other drying vegetable oils may be employed in the manner already used in rubber manufacture.

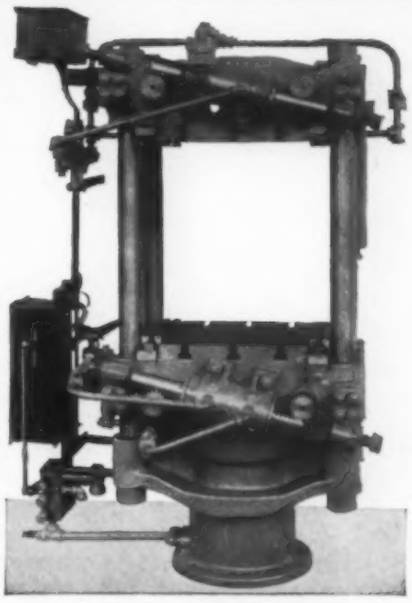
3. Lee 389,519, September 11, 1888.

A laminated substance made of mica, in a comminuted state, mixed and incorporated with a resinous gum, such as shellac, by the aid of heat.

4. Lee 409,985, August 27, 1889.

Waste comminuted mica is mixed with commercial silicate of soda or water-glass in the proportion of about two and one-half parts of mica to four of the silicate and enough water to make the mass work well under the trowel. One or more coats of this plastic mass may be placed wherever it is desired to form a surface of low conductivity which will resist high temperatures, or it may be pressed and molded into solid or hollow objects for the same purpose. In

(*Continued on page 574*)



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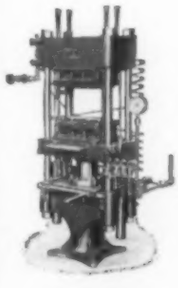

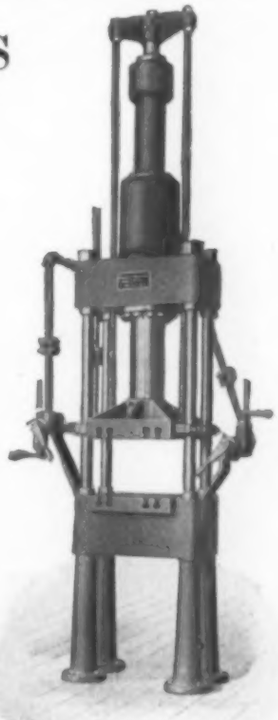

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Continued Activity of Inventors Enriches The Field of New Resinous Compositions

A veritable storm of new ideas, some good, some better and some worse, bewilders the new comer in this art

By Carl Marx

Continuing our review of the recent patents in the resin field (April-June) from page 514 of the September issue we find the contributions of

The Barrett Company

The next four patents are the result of work done for the Barrett Company, who produce very large amounts of coaltar products, and who developed the commercial cumarone or "Cumar" resins some years ago. All four patents are by the same inventors and assigned to the Barrett Company. They are:

1,667,197; 1,667,198; 1,667,199 and 1,667,200. April Water-resistant Polyhydric alcohol-carboxylic acid resins. 24, 1928. Charles R. Downs and Louis Weisberg. The four patents must be considered together as they are very similar, and the last three are the results of divisional applications that were derived from the first application, which was filed Dec. 22, 1920, or almost eight years ago. Most of the disclosure is in the first patent, the other three carrying claims that patentably distinguish from each other and the parent case, although the examples are virtually identical. The processes involve the formation of a number of resins from polyhydric alcohols and carboxylic acids. Instead of using phthalic acid with glycerol, the inventors condense glycerol with one or a mixture of the following organic acids: fumaric, maleic, malic, succinic, tartaric, malo-malic, phthalic, diphenic, 1.8-naphthalic, benzoyl-benzoic, methyl-benzoyl-benzoic and chloro-benzoyl-benzoic acids. In example 1, glycerol is heated with maleic acid in the proportion of mol to mol, but not to temperatures exceeding 200°C, so that a soluble "A" stage resin results. Further heating converts this to the B-stage. In order to use the materials for molding the B-resin may be ground and allowed to stand in contact with acetone for some time, whereby it will swell and form a sort of jelly that permits of mixing in fillers and coloring matter, and this, after evaporation of the solvent, may be molded in much the usual manner. Alternatively the soluble A-resin may be mixed with fillers and converted by heating to the B-stage, whereupon it is ground and then the powder used as a molding composition. The material must be handled somewhat differently than the regulation phenol resins, and space here does not permit giving all the details, of which the patent gives many. The claims of the patents differ mainly in the exact products produced. The patents are well worth careful study on the part of those engaged in similar lines of work.

Phenol Urea Casting Resins

The permutations and combinations possible in preparing resinoid substances appear to be unlimited. Urea and formaldehyde have been condensed to form resins, but the next patent to be considered combines phenol with urea.

A particular advantage is the fact that these materials can be cast instead of molded under pressure.

1,667,675. April 24, 1928. Howard Vincent Potter and John Willies Crump, Birmingham, England, assignors to The Damard Lacquer Co. Accelerator for Hardening Phenol Urea Products. This covers hard infusible and insoluble C type resins, from which objects are made by casting the reactive mixture, or by afterwards cutting the blocks obtained by the process. Neither heat nor pressure is required in carrying out the process, so that it is really quite simple. For example 100 parts of phenol, 200 parts of urea (both by weight) and 600 parts by volume of 40% formaldehyde solution, when merely mixed together and without heating will commence to "set" in about 5 to 10 minutes and become permanently hard and infusible in from 1 to 1½ hours. Other proportions will set slower or faster. The addition of acid condensing agents, such as sulfuric acid, hydrochloric acid, phosphoric acid, oxalic acid etc. will increase the speed with which these materials will react, so that in some cases the final hardness is reached in less than an hour. Slight warming will speed up the action but heating is not advised as the reaction may then be too rapid to permit accurate working. The preferred accelerating agent however, and the one specifically claimed, is urea nitrate. The invention dates back to 1925, when the British patent was filed.

Flexible Resinoids

1,668,444 and 1,668,445. May 1, 1928. Edward L. Aiken, assignor to Carboloid Products Corp., Newark, N. J. Plastic Material; and Flexible Molded

Articles of Condensation Products. The two patents are closely related, both being filed September 23, 1921. They cover the production of a flexible but infusible and insoluble condensation product of resinoid type. The raw materials are glycerol or its equivalent such as the various glycols, phenol, and a methylene containing body such as paraform. The process is characterized by the fact that an initial condensation is effected between the glycerol and the phenol, forming either the mono, di or triphenyl glyceryl compounds. These are dark colored viscous liquids. The reaction is effected by mixing the proper proportions of glycerol and phenol and then passing hydrochloric acid gas through the mixture while heating the same. The hydrochloric acid takes up the water formed during the reaction, although anhydrous copper sulfate may be used to the same effect. The product is afterwards completely dehydrated by heating to 110°C. The liquid reaction product comprising the phenylglyceryl compounds is then mixed with from 8.5 to 30 parts of paraform, whereupon, by heating, the material is condensed into the insoluble form. The material is however very flexible, and according to the exact conditions may be as soft as jelly or of the general consistency of tortoiseshell. The condensation may be effected in molds under heat and pressure, or the objects may be first molded and then further cured into the desired state of infusibility by additional heating outside of the molds. The second patent is practically the same as the first, claiming the material from which the objects are produced, although the claims are all directed to the processes.

Multicolored Hardened Resin Blocks

1,668,590; May 8, 1928. Max Hilfreich, Vienna, Austria. Manufacturing Blocks of Artificial Resin in Different Colored Layers. Already cured and hardened sheets of infusible and

(*Continued on page 566*)

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Some Thoughts Engendered By The Radio Show—Trend in Plastics

(*Continued from page 554*)

dressing material and the like. Properly impregnated sheets of paper are assembled and instead of being molded into mere flat sheets are formed directly into the trays, many different designs being possible.

The particular advantages claimed for these trays is that they are noiseless and hence very useful about a hospital or sick room. Furthermore they will withstand sterilizing temperatures, and as they have no rims that conceal and entrap dirt such as metal trays are prone to do, they meet every requirement along sanitary and aseptic lines. It can safely be predicted that this line will be further developed. One might suggest instrument cases and trays, drill holders and sterilizers and similar types of surgical accessories.

Other Products

The Bakelite Corporation also had a large and complete display of molded radio and electrical parts, most of it being identical with the showing made last year. Some excellently made low-loss short-wave type of coils, supported on cut-away laminated tubes, or on specially delicately molded parts were a feature of the exhibit. The question of short-wave receivers also received some attention and at least one completely assembled short-wave adaptor for use with standard radio sets was shown. In this case the entire receiver case was molded.

Television was also demonstrated, but as far as can be seen at present, not much molded material was in evidence. However the writer can conceive of scanning discs made of laminated or molded material, and it is not unlikely that several parts of a television receiver might profitably be molded.

As an active competitor for molded cabinets, the appearance of a pressure die-cast aluminum alloy receiver might be mentioned. The present vogue for complete metallic shielding makes this a logical material—thus further cutting into the use of plastic materials in the radio industry.

In the face of all these changes, it behooves the producers of plastic material and the molders to be on the alert for the possibility of complete molded cabinets, especially those of ornate design, where the cost of carving the wood makes wooden ones expensive. Of course the dies and molds are costly, but if a large production of a standard case or cabinet could be assured, the rapidity of production and absolute uniformity and interchangeability of the parts will make it worth while.

The gradually lowering cost of the molding compositions also will undoubtedly lead to the adoption of molded articles of considerable size, and the future development of this art may be expected along such lines.

Further developments of interest to the molding industry, is the discovery of compositions that can be molded under comparatively little pressure, so that large and heavy hydraulic presses may be eliminated. It is still too early to give details, but we have some confidential information that we may soon be in position to make public, being only hampered in so doing by the patent situation.

Undoubtedly, despite these changes that perhaps redound to the disadvantage of some, the plastic molding industry is a healthy young one, and great enlargement of the scope of this art can confidently be expected.

Resin Art

(*Continued from page 565*)

insoluble phenol resinoid material, properly colored or mottled are placed, in the form of sheets, into a tank in proper spaced relationship, whereupon uncured still fluid resin material is poured about the plates and the entire mass is then hardened. The process was described and illustrated in detail in an article appearing in the September issue of *Plastics*, p. 500.

The Bakelite Corporation

During the same two months, the Bakelite Corporation is represented by two patents. The first one:

1,667,872. May 1, 1928. Conrad F. Schrimpe, assignor to Bakelite Corporation. Butyl Aldehyde Phenol Resin and Process of Making the Same, relates to a condensation product of the reagents stated in the title of the patent. The reaction is carried out in the presence of an acid catalyst such as hydrochloric acid under a reflux condenser until a fusible resin results. This can be accomplished by first allowing the strongly exothermic reaction to subside and then heating the mixture of the butyl aldehyde and phenol to about 180°C, whereby the product is dehydrated. It is permanently fusible and soluble. It can however, by admixture of hoxamethylenetetramine be converted into an extremely hard infusible and insoluble resin. The claims broadly cover a resinous condensation product of phenol and butyl aldehyde.

1,673,239. June 12, 1928. Frazier Groff, assignor to Bakelite Corporation. Laminated Product and Method of Making the Same. A laminated tough material especially suitable as a base for making gears and similar structural parts is produced by impregnating fabrics such as paper, cardboard, woven or felted fabrics such as canvas or duck with a phthalic acid glycerol type of resin (although succinic acid, oleic acid, stearic acid etc. many replace the phthalic acid or its anhydride). The resin impregnated fabric is then

cured until the resin is practically infusible. An alternative is to mix the resin with the loose fibers in a paper beater to form paper containing the resin which is then hardened. The sheets thus obtained are sprayed with or dipped into a reactive resin mixture of the phenol-methylene type, stacked and then subjected to heat and pressure in the usual way in which laminated stock is made. Still another method is to alternate sheets of material impregnated with the hardened glycerol-phthalic anhydride resin and sheets impregnated with a reactive phenol-methylene resin and then to consolidate the sheets as above. The claim covers a laminated structure comprising fibrous sheets impregnated with a resin of the glycerol-phthalic anhydride type, bonded together by a phenolic resin; and the method of making such a sheet product.

Other Workers in this Art

The list of assignees of the various resin patents makes it evident that all the large chemical manufacturers are aware of the tremendous importance and the great future of the plastic materials of the resinoid type.

1,669,674. May 15, 1928. Charles J. Romieux, assignor to American Cyanamid Co. Phenol Resin and Method of Making the Same. According to this invention, very good curable resins can be produced from the relatively inexpensive commercial "crude cresylic acids" which essentially consist of the higher homologs of phenol, such as the xylenols, although they may comprise a number of such phenolic bodies. The process is characterized by the use of only very small amounts of an alkaline catalyst, such as sodium hydroxide, by means of which cresylic acids boiling between 209°C. and 280°C. are condensed with an equamolecular proportion of paraformaldehyde, yielding an excellent curable resin. The sodium hydroxide used is less than 0.1% based on the amount of the phenol used, and may be as low as 0.03%.

(*Continued in November issue*)

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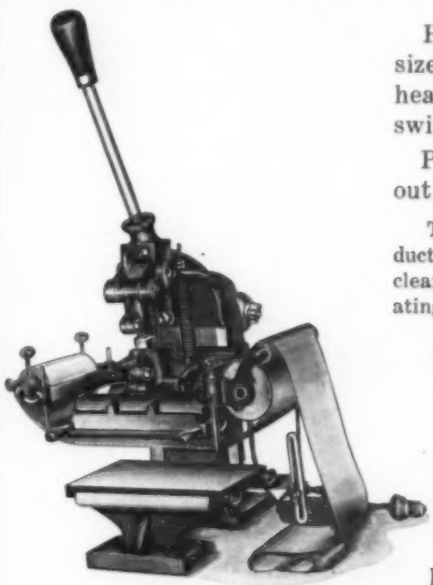

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TECHNICAL ABSTRACTS
AND PATENT REVIEW

Veneer of resinoid material. James McIntosh, assignor to Diamond State Fibre Co., Bridgeport, Pa. U. S. P. 1,661,901, March 6, 1928.

The method of manufacturing thin veneer sheets which consists in impregnating a fiber sheet with a synthetic resin in its soluble and fusible condition, applying the impregnated sheet to the face of a laminated and easily delaminated fiber body, converting the resin into its hard and infusible state so that the same adheres to the sheet and separating the sheet from the body with an adhering portion of the latter forming on one face of the sheet a fibrous surface. The article is also claimed.

Sulfur-starch plastics. Carleton Ellis, assignor to Ellis-Foster Co., Montclair, N. J. U. S. P. 1,665,186; Apr. 3, 1928.

44 lbs. of wood flour, 24 lbs. powdered starch and 14 lbs. flowers of sulfur are mixed in a ball mill with the addition of 50 lbs. of water to moisten the mass. The mixture, which is but slightly moist to the touch, is then molded in cavity molds at 200°C. for three minutes. A product having some resemblance to wood results, but it is somewhat porous. Coloring matters, oils, etc., may be added. Boxes may be made from the mixture, which of course is very inexpensive. The material is hard and rigid.

Phonograph record with heavy knurled rim. Anthony J. Vaselli, assignor to Columbia Phonograph Co., Bridgeport, Conn. U. S. P. 1,665,759; Apr. 10, 1928.

The record is molded in a die that provides for no flash. The edges are about twice as thick as in the regulation records, and slope toward the starting groove of the record so that the needle when placed almost anywhere within the rim will naturally slide down toward the starting groove, so that the record can be started even in the dark. The heavy rim also prevents breakage and marring of the sound grooves.

Mechanical lowering of viscosity of cellulose nitrate solutions. George H. Tozier, assignor to Eastman Kodak Co., Rochester, N. Y. U. S. P. 1.666.049; Apr. 10, 1928.

Cellulose nitrate, such as pyroxylin scrap etc. is dissolved in a solvent and placed in a ball mill where it is rotated with the flint balls. The mill is rotated at about 20 to 30 r. p. m. for from 4 to 11 days. resulting in a lowering of the viscosity of the solution to below 80% of its original value. The claim covers the process only, but comprises subjecting the solutions to rubbing and stirring forces.

Cellulose ester films and method of making the same. Henry James Hands, assignor to Spicers, Ltd., London, Eng. U. S. P. 1,666,377; Apr. 17, 1928.

Cellulose ester solutions are applied to travelling temporary supports from a plurality of hoppers provided with micrometric adjusting screws so that thin layers of different cellulose esters may be deposited in succession upon the travelling supports so as to provide a final film differing in its composition progressively from one side to the other.

Preparation of a thermoplastic pulp. Albert L. Clapp, assignor to Bennett, Inc., of Boston, Mass. U. S. P. 1,668,760, May 8, 1928.

A mixture of wood flour, water and some sodium silicate in water has added to it some molten Montan wax or other easily molten substance, such as a natural resin, and enough cool water is then added to cause the granulation of the dispersed thermoplastic material, which adheres to the wood pulp so that the water can be drained away, leaving a mass that can be squeezed together with the hands. However it is preferred to make the mass into a coherent sheet by the usual methods of paper manufacture. Subsequent heating of the sheet will cause the flow of the thermoplastic material to water-proof the same, this being done by heated calendering rolls.

Molded product from amphibole or the like. Louis H. Hartung and Frederick Folbert, Detroit, Mich. U. S. P. 1,668,768; May 8, 1928.

14 parts amphibole or asbestos, 14 parts magnesite, 20 parts diatomaceous earth, 2 parts zinc chloride, 1 part aluminum sulfate, 1 part of soap and 7 parts of silicate of soda are mixed together with enough water to form a stiff dough which is subsequently molded and dried. The dried article is then treated with a solution of soap in hot water for several hours and again dried. A subsequent treatment with a 20% calcium chloride closes the pores of the mass and gives it a hard rock like surface.

Joining glass by resinoid cement. Bernard Long, assignor to Societe anonyme des Manufactures des Glaces & Produits Chimiques de Saint-Gobin, Chauny & Cirey, of Paris, France. U. S. P. 1,668,853; May 8, 1928.

Two pieces of glass that are to be joined (NOT laminated) have their edges carefully ground with very fine emery, and the edges are then coated with a heavy solution of a phenol-formaldehyde resin such as Bakelite, or the molten A-resin is applied, the glass being warmed to about 80°C. during the operation. The surfaces are subsequently pressed together at about 5 kilograms per square centimeter pressure while the glass is heated to 150°C. The joint is stronger than the glass itself and virtually entirely invisible to the naked eye. For producing very large sheets, the process appears to have considerable promise.

Joining two cinematographic films together face to face. John Edward Thornton, West Hampstead, England. U. S. P. 1,670,672; May 22, 1928.

Pyroxylin plastic films having a gelatin emulsion are fastened together with their emulsion sides by coating the films with a composition of 100 parts glue, 50 parts acetic acid, 10 parts molasses or glycerol, 1 part ammonium bichromate and 100 parts water, letting dry and pressing together whereby the ammonium bichromate eventually insolubilizes the glue cement used for holding the films together. The process probably applies to color cinematography wherein two colored films are superposed to give color vision effects.

"Window liquid" containing celluloid. Karl Deubel, Newark, N. J. U. S. P. 1,672,604; June 5, 1928.

A frost-preventing liquid adapted to be applied to windows consists of parafin oil, Canada balsam, xylene, castor oil, toluene, melted (!) celluloid, ethyl acetate, acetone and some fuchsine for coloring matter. The composition is applied to automobile windshields to prevent fogging by rain, etc. Inventor says it is not (?) inflammable.

Plastic Hydrocolloid Composition. Alphonse Poller, of Vienna, Austria, assignor to De Trey Brothers, Ltd., of Zurich, Switzerland. U. S. P. 1,672,776; June 5, 1928.

A plastic composition suitable for taking impressions of teeth cavities, oral work, masks of living persons for sculpture, etc., is made by methods that take into consideration the modern knowledge of colloid physical chemistry. A base material such as unvulcanized rubber is converted into extremely minute threadlets or globules by spraying and is mixed with such thermoplastic materials as stearin, ceresin wax, paraffin, mineral wax, copal, dammar or similar resins. Glycerol is added. Fillers such as bismuth subnitrate, and tannic acid or alum are also added, as well as fibrous materials as silk, nettle, cotton etc. to enhance the body structure. The material is applied warm, but will solidify at body temperature in about 1½ minutes, leaving a very faithful casting from which plaster models, etc., can be made. The purposely produced net-work of rubber lends it desirable properties.

Phenol-formaldehyde products for coating aluminum castings. Walter C. Petersen, assignor to Packard Motor Car Co., Detroit, Mich. U. S. P. 1,672,280; June 5, 1928.

To close the pores in aluminum castings such as are used on motor cars, the same are coated with a composition derived from a preliminary condensation product of 55-60% of phenol with 35-40% of formaldehyde heated together to from 180-210° F. until reduced to one-half original volume. The molasses-like composition is then applied by spraying or the like to the aluminum casting which is then baked. About 10% of kaolin or similar clay-like substance is added to the material before its application. (Evidently a resinoid forms on baking, closing up the pores in the casting so that no oil can leak through. The patent does not disclose the specific application, but it is probably used on gear housings, and the like. Ed.).

Cold-molding composition. Cletus F. Chosa, assignor to Cutler-Hammer Mfg. Co., Milwaukee, Wis. U. S. P. 1,671,229 and 1,671,230; May 29, 1928.

Compositions suitable for cold molding and subsequent induration by heating may consist of 40 parts stearine pitch, 60 parts asphalt, 10 parts castor oil, 25 parts benzene. The mixture (except the benzene) is incorporated while heated to about 500°F. Castor oil is added at about 475°F. When cooled to about 200°F. the benzene is added. 286 parts of the binder thus produced are mixed with 1100 parts of a filler such as asbestos, plus 66 parts of sulfur and 22 parts of iron oxide, the sulfur acting as a sort of vulcanizing agent. Storing for 12 hours prior to use is advised. It is cold molded and the objects are then heated for from a few hours up to beyond 24 hours at temperatures gradually rising from 200 to 500°F.

Thermoplastic shellac-like rubber composition. Harry I. Fisher, assignor to B. F. Goodrich Co., New York, N. Y. U. S. P. 1,668,235; May 1, 1928.

Thermoplastic rubber compositions having either the properties of balata, or the thermoplastic with the general nature of shellac, can be obtained by heating rubber with toluene sulfonic acid, preferable the para compound. Thus, to produce a shellac-like mass, rubber mixed with about 1/10 of its weight or paratoluene sulfonic acid is heated in a container at 130°C. for 3 to 4 hours. After about one hour the temperature within the mass rises to 200-240°C. and higher, the mass melts and bubbles of gas are given off. The weight loss is about 3-4%. A fusible, hard, brittle shellac like mass, soluble in benzene, chloroform and similar solvents results. When mixed with pigments and fillers it can be molded by shellac-molding technique.

Cellulose Esters not neglected. See November.

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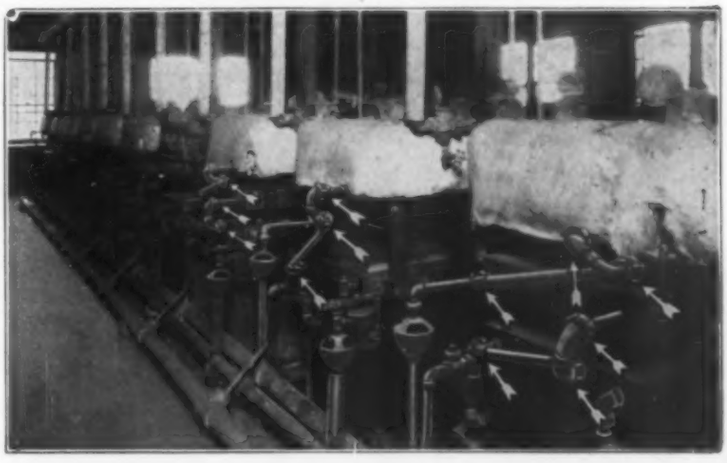

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Casein and Its Industrial Applications.

Edwin Sutermeister. 296 pp. Price $5.00. Illustrated. 1927.

Eleven authorities, many of them specialists in this field, have contributed to this volume. "Casein Plastics" is from the pen of Dr. Geo. H. Brother.

* *

The Chemistry of the Natural and Synthetic Resins.

T. Hedley Barry, Alan A. Drummond and R. S. Morrell. 196 pp. Price $5.50. 1926.

The work of three English chemists, who are recognized authorities on this subject, one of vital interest to the Plastics Industries.

Celluloid.

Its raw material, manufacture, properties and uses.
Dr. Fr. Bockmann. 188 pages. 69 illustrations. $3.50.

In this book, the raw product, cellulose and its properties are thoroughly described. Other raw materials and methods of rendering them more plastic also receive attention.

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Carleton Ellis. 514 pages, illustrated. $8.00.

The book will serve as a guide and prove a stimulus to the numerous investigators and practicioners in the field of artificial resins. The section on plastic molding is an especially valuable feature.

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Furfuralcohol Resins

(*Continued from page 558*)

use of refrigerating coils within or around the vessel containing the mixture.

"Another convenient way of regulating the temperature is to heat the furfuralcohol with a quantity of water. For example, 500 grams of furfuralcohol are dissolved in 900 grams of water containing about 5 grams of hydrochloric acid and heated with constant agitation. When the temperature of this mixture rises to 70 to 80° C., an exothermic reaction starts and the resin begins to form. Because of the exothermic action the temperature will rapidly rise to about 98° C. but after a few minutes it will fall to about 93 to 95° C. where it may be allowed to remain for an hour or more until the reaction reaches the desired stage. When the reaction has progressed to a point where resin of the desired consistency is obtained, the water may be separated and the catalyst may be washed from the resin, preferably with a very weak alkaline solution. Extremely viscous, tacky resins may be obtained by this process.

"With certain catalysts, the process may be efficiently and rapidly carried out by heating the reaction mixture under pressure to temperatures above the atmospheric boiling point of the furfuralcohol.

"Aside from the control of the reaction by regulation of the temperature, we have found that the speed and extent of the reaction may be controlled by varying the percentage of active catalyst present. For example, by adding one per cent. (1%) of the hydrochloric acid, the reaction will immediately be manifested by producing a blackening of the mixture. If such a mixture is then heated, the reaction may become violent and difficult to control. If the strength of the acid is increased beyond one per cent. (1%), other conditions being as above described, the acid by itself without heating may cause a

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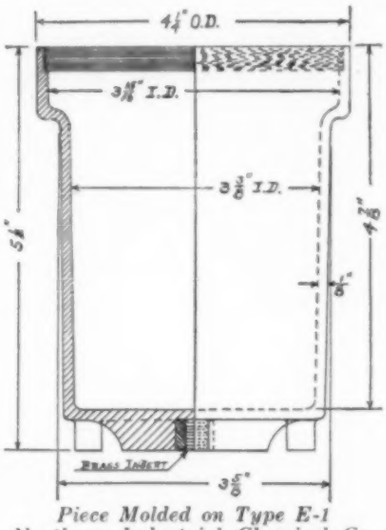

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Standard Stroke	**12"**
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violent reaction. However, the reaction is usually most readily controlled with weak acids. The speed of the reaction may thus be also checked by neutralization, dilution with an inert liquid, or removal of the catalyst.

"In the initial stages of the reaction, the mixture takes on a darker or blackened appearance. As the reaction proceeds a substance in the nature of resin is formed under properly controlled conditions of heat and catalysis. This substance is liquid at temperatures around 110° C., but upon cooling, it becomes a thick viscous mass which is soluble in acetone, furfural or other solvents, but is substantially insoluble in water. If the reaction is allowed to proceed as by further heating or by permitting the exothermic reaction to proceed, a solid resinous body which softens upon heating is obtainable. When the reaction proceeds to a conclusion, a substantially infusible, insoluble resin is obtained.

"By properly controlling the speed and extent of the reaction as above described we are able to secure products of various degrees of consistency, dependent upon the stage at which the reaction is arrested.

As above stated, we have also found that under certain conditions, furfuralcohol may even be converted into a resin without the aid of catalysts. For example, the furfuralcohol may be refluxed at a temperature approximating its atmospheric boiling point. If this heating process is carried out for several hours at a temperature approximating 170° C., substantially all of the alcohol will become resinified.

"Since the reaction is readily controlled in accordance with our invention and may be arrested at any stage in the resinification of the alcohol, the resulting resins are adaptable to the various uses of the synthetic resins, natural gums, and resins.

"Among other uses, the product may be utilized for the impregnation of various fibrous materials, may be incorporated in varnishs, and in either its

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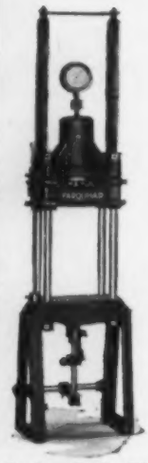

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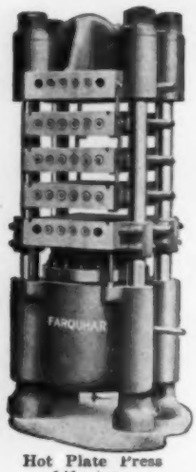
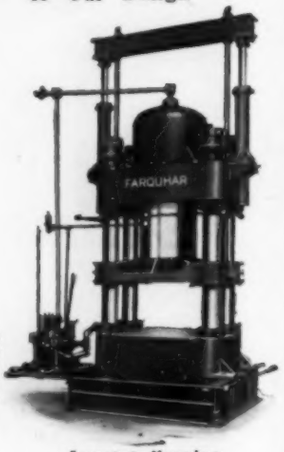


Hot Plate Press 141 tons.



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viscous form or when softened by heat or with suitable solvents it may be used as a binder for fillers to provide a mixture for molding purposes. Such mixtures may be reduced to a powder and used in hot or cold molding operations.

"In the manufacture of molded goods and many other commercial applications resins normally are transformed into the insoluble and infusible state during the process. It is particularly advantageous that we are able to convert furfuralcohol resin into this state by the combined action of heat and catalysis, or by the use of either of these agents acting alone, the reaction being effected either with or without the use of pressure."

Testing Methods

(*Continued from page 561*)

block, located whenever practicable at the top, and the metal bearing plates shall be directly in contact with the ends of the test specimen. The pressure heads used for standard compression tests of cement (see Tentative Specifications and Tests for Compressive Strength of Portland-Cement Mortars (Serial Designation: C9—16 T) of the American Society for Testing Materials)[1] are satisfactory for this test.

Specimen

7. The test specimen shall be molded in the form of a cylinder having a height of 1.25 in. (31.8 mm.) and a diameter of 1.125 in. (28.6 mm.) (Fig. 2). The ends shall be flat and perpendicular to the axis, being ground to this condition if necessary.

Method

8. (*a*) Five specimens shall be crushed in the condition in which they are received.

Additional tests shall be made at elevated temperatures, the actual temperatures selected depending upon the use that is to be made of the material. Five specimens shall be tested at each

[1] **Proceedings**, Am. Soc. Testing Mats., Vol. XX, Part I, p. 599 (1920); also 1927 Book of A.S.T.M. Tentative Standards.

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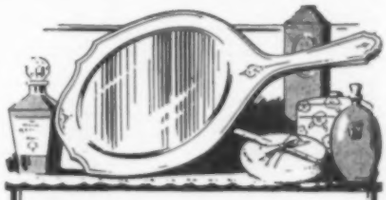

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temperature selected. The specimen shall be kept at that temperature a sufficient length of time to become of uniform temperature throughout and shall be maintained at that temperature during the test.

NOTE 1.—A convenient method of making this test is to submerge the specimens in a suitably lagged, electrically-heated oil bath of about two gallons capacity. The specimens should be placed in the bath at least 30 minutes before testing and the temperature maintained approximately constant at the desired testing temperature until the completion of that test. A pale mineral oil having a viscosity of 100 seconds ± 10 seconds at 38° C. (100° F.) Saybolt is satisfactory for this purpose. The specimens should not be placed in the oil an excessive time in advance of testing. The oil bath should be well stirred to insure uniform temperature throughout. The temperature should be determined by means of a thermocouple sealed in a similar specimen in the bath; or by the use of an A.S.T.M. partial-immersion thermometer conforming to the Standard Specifications for A.S.T.M. Partial-Immersion Thermometer for General Use, −20 to +150° C., 0 to +300° F. (Serial Designation; D. 182) of the American Society for Testing Materials,[1] so inserted in a hole in a specimen that the bulb is completely enclosed and sealed in.

If tests are required over the whole range of temperature rather than at particular points, the method of testing may be found simpler and quicker if modified in accordance with Note 2, below.

NOTE 2.—The oil with 5 specimens immersed in it should be heated to the highest temperature to be used and allowed to cool slowly. Specimens should be tested in succession and the average temperature during the actual time of testing of each specimen taken as that corresponding to each strength determination. Specimens should be added to the bath successively on such a schedule that each will remain in the bath at least 30 minutes before testing. An average curve shall be drawn through the plotted data.

(*b*) The load shall be applied on the ends of the specimen and the cross-head speed of the testing machine shall be such that the load can be accurately weighed but shall not exceed 0.050 in. (1.27 mm.) per minute when the machine is running idle. For the best results use the slowest possible speed.

Report

9. The report shall include the following:

(*a*) The dimensions of each specimen in inches or in millimeters;

(*b*) The load on each specimen in pounds or kilograms at the first sign of failure;

(*c*) The ultimate compressive strength in pounds per square inch or kilograms per square millimeter, of each specimen, calculated from the measured area of each specimen before the load is applied;

(*d*) The general character of the material tested, with description of how it acts under the applied load;

(*Continued in November issue*)

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Molded Mica

(*Continued from page 563*)

case the compound is to be molded, the water may be omitted and more silicate of soda used, according to the result desired, whether of a greater or less degree of hardness.

5. Gould 433,284, July 29, 1890.

A non-conductive handle composed of parallel layers of mica strung on a suitable support.

6. Splitdorf 437,632, September 30, 1890.

The invention consists of a wire or conductor covered with flat strips of mica combined with a strengthening material of paper or cotton and spirally wound on the wire.

7. Kimble 464,367,: December 1, 1891.

In preparing the composition forty parts by weight, of mica in the form known as "atomized" mica, forty parts of talc or its equivalent, and about three parts of silicate of soda are thoroughly mixed or incorporated by attrition, using any well-known mixing apparatus. The mass at this stage does not contain sufficient moisture to make it pasty or coherent, but is in a loose condition. When subjected, however, to a pressure of, say, five thousand pounds to the square inch, more or less, it compacts into a dense solid coherent mass and retains its shape perfectly after the pressure is removed.

This article continues in the November issue.

Complete Histories of the Personnel & Business Activities of the Outstanding Leaders in the Plastics Field are in Preparation

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Vol. 2 OCTOBER, 1928 No. 10

Plastic Tiles Promise Large New Market For the Industry

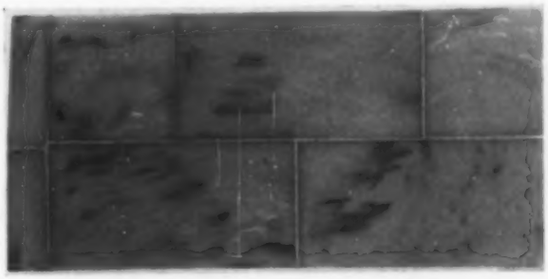
TILES made of plastics. Does it appear a little fantastic? Is it practicable? Can the building trade be educated to use them? These questions press upon one at this novel suggestion.

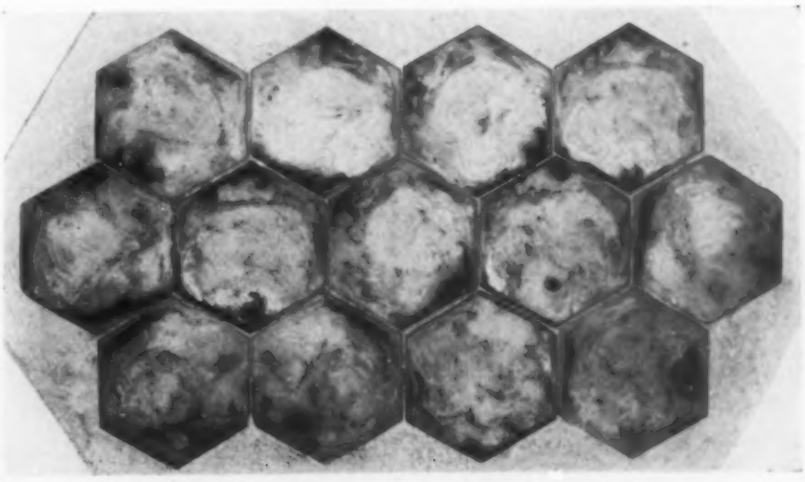
And yet why not? No other material offers the variety of color and richness of tone that plastic products do. And builders have recently grown more and more conscious of the appeal of color. Hence the mushroom growth of new styles in bathroom and kitchen decoration. Color has come to lay the ghost of glaringly white kitchen walls and the cold atmosphere of colorless bathrooms. Green, blue and even lavender bathroom fixtures and tiles have found an avid market in recent years and manufacturers have not been slow in developing this new and promising field.

Now synthetic resinoids bring to this style-conscious market their peculiar appeal. In place of the solid, dull opacity of the usual tiles, plastics introduce the partially transparent, richly colored product that only this material can furnish. A glance at the accompanying illustrations reveals the individual qualities of the new tiles. Their depth in tone and warm coloring assure a soft and mellow appearance.

While the new plastic tiles have their advantages they can be made of course in opaque colors as well and so embody all the features of the usual tiles without suffering from their limitations.

This new and highly promising application of plastics to the building trades was made possible through the work of the chemist Sylvester Milano. Mr. Milano has been for some time experimenting with means for the cementing of plastic tiles. He has now developed an adhesive that assures the practicability and permanence of the new tiling. From the point of view of the tile





there is nothing new in the plastic tiles. The operations the tiler needs to perform are identical with those for the usual tiling. This is made posible by a pretreatment of the plastic tiles. Before leaving the factory the tiles are treated to make their adhesion to cement possible. Patents have been applied for to protect the use of this treatment the nature of which the inventor does not wish to disclose at present.

It is almost needless to indicate to the present readers that the plastic tiles are undeniably superior in strength to the old types. Their better mechanical properties prevent chipping and render them more durable.

Tiles made of plastic material have the additional merit of easier adaptation for unusual fittings. These tiles may be readily shaped by sawing or filing wherever required.

But though the plastic tiles are stronger they are also lighter than ordinary tiles. In cases where opague tiles are desired the new tile may be made of very thin sheets, which would reduce the cost without impairing the appearance of the product. Made of thicker sheets, plastic tiles are readily adapted for floor tiling.

Wherever a fire proof, waterproof and hygienic tiling is required there plastic tiles will serve better than any other. According to Mr. Milano the formaldehyde content of the synthetic resinoid tile retains its hygienic properties and so should make the tiles particularly desirable for hospitals.

The photograph shown on this page, of plastic tiles appropriate for bathrooms or hall tiling suggests some of the possibilities of this new product. Unlimited variation in shape and color are possible and color harmony is too complex for these tiles.

There is in addition a peculiarity of plastic tiles which should compare very favorably with the tiles at present used. The usual bathroom tiling has an uncomfortably cold touch that is enough to set any bather shivering after contact with the tiled wall. Due to the different composition and heat transmission characteristics of plastic materials, the plastic tiles have a much warmer touch and so render them more comfortable for bathroom and other uses.

Mr. Milano hopes eventually to develop similar tiles of casein plastics. He has already succeeded in reducing the water absorption of casein and after further research he believes he can produce casein that will adequately serve for tiling.

The reader will be surprised to learn that these tiles have not as yet been placed on the market. The photographs shown here were taken of experimental specimens. But these samples of synthetic resinoid tiling have been carefully tested and have shown every indication of a successful product.

It is of course not to be supposed that the plastic tile will completely supplant the ceramic. But wherever interior decoration requires delicate shades, subdued coloring or unusual brilliance and variety, there plastic tiles will be welcome to the building trade.

Here is an instance of the type of development that this industry particularly needs. A radical departure. A direct invasion of a market formerly supplied exclusively by a different industry. It is through such trade extension that the greatest growth is to be achieved.

Synthetic Camphor

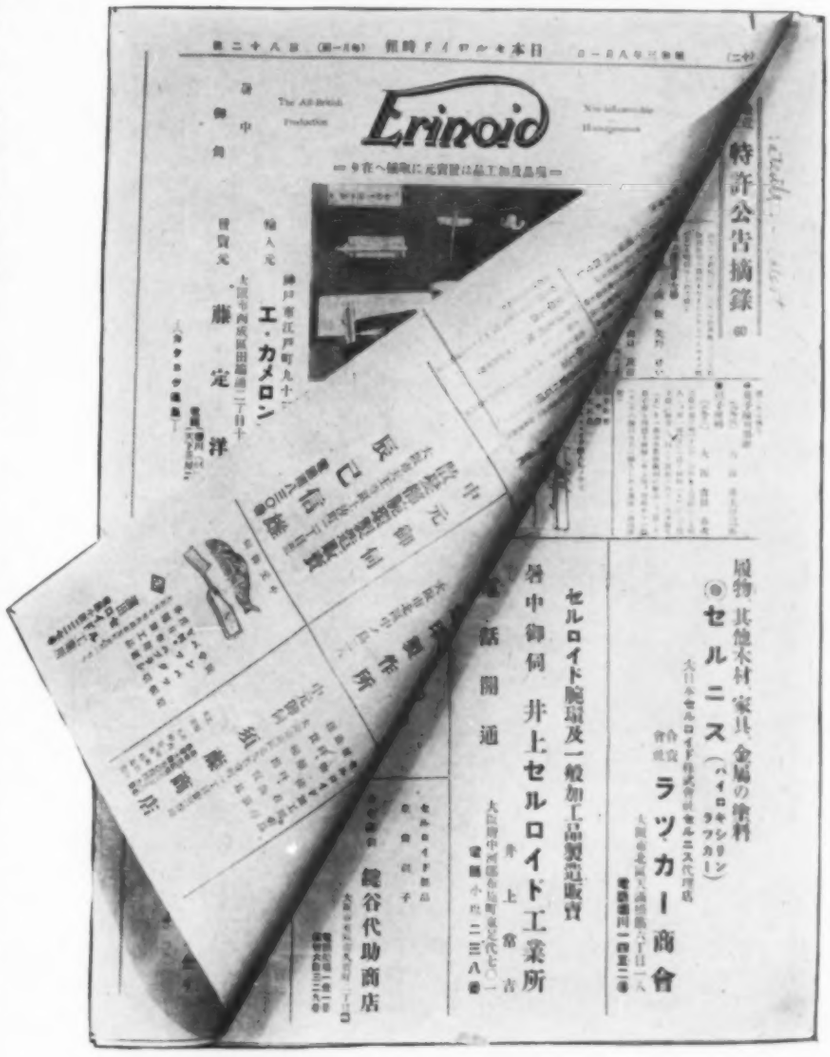
THE French concern manufacturing synthetic camphor, the Societe Alsacienne des Produits Chimiques of Mulhouse, has just carried out experiments with a new manufacturing process and the results are stated to have been sufficiently favorable to have led the company to take out patents for virtually all large countries. The camphor produced in Japan is obtained from the island of Formosa whereas the greater part of synthetic camphor is at present produced in Germany, although some other countries have taken initial steps toward the development of this industry.

Japanese exports of natural camphor decreased in 1927 to 1,471,200 kin, which is less than one-half of the exports for 1922. (1 kin=1⅓ pounds). However, during the last months of 1927, a sudden increase was observed which continued during the present calendar year so that the amount of natural camphor exported during November and December, 1927, and January and February, 1928, amounted to 2,049,300 kin, exceeding total exports of that commodity during 1927, and being three times the amount exported during the corresponding period of 1926-27. The setback in camphor exports during the first part of 1927 is explained by the fact that the price of the Japanese product was at that time much higher than that of synthetic camphor. The price relation has since changed in favor of natural camphor due to a substantial price cut effected by the Japanese camphor monopoly during the first half of 1927, said to be predicated upon new methods which have reduced the cost of production by 20 per cent. The Japanese camphor monopoly claims to operate at a good rate of profit, whereas the German manufacturers of synthetic camphor are now said to have little or no margin of profit. (Consul H. C. Claiborne, Frankfort on the Main, Germany.)

JAPANESE PLASTICS

A Note On The Celluloid Industry In Japan

By R. Sekido
Nara-Osaka, Japan



A Japanese plastics trade journal.

Recent years have shown a marked development in the celluloid industry of Japan. Production has even exceeded the demand with the result that prices have been gradually lowered. The following tables indicate the output of various plants:

Plants located in Osaka; monthly output in thousands of pounds:

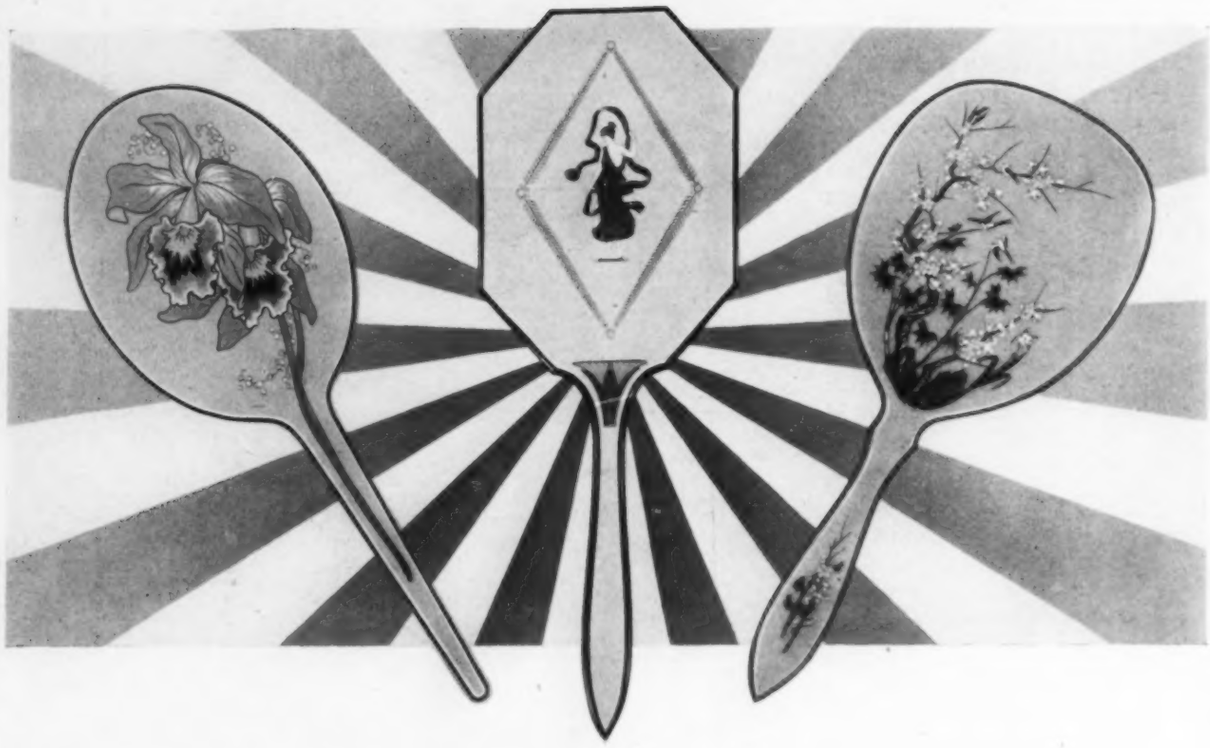
Dainippon Celluloid Co.	500
Kokusai Celluloid Co.	30
Osaka Celluloid Co.	20
Koyama Celluloid Co.	20
Sun Celluloid Co.	15
Nakatani Celluloid Co.	15
Tsutsunaka Celluloid Co.	25
Takikawa Celluloid Co.	25
Nishida Celluloid Co.	10

Plants located in Tokyo; monthly output in thousands of pounds:

Nagamune Celluloid Co.	30
Tokyo Celuloid Co.	30
Taishe Celluloid Co.	30

The figures here given are not accurate. According to this estimate the total output of these plants is 250,000 lbs. per month.

The export of celluloid manufactures from Japan was valued in 1927 at 8,480,000 yen; in 1926, 8,731,000 yen; in 1925, 8,306,000 yen.



Creating a New Vogue In Boudoir Accessories

By P. A. Dillman *

"WAS the watch you wear in style in the days of the high-wheeled bicycle?" reads the advertisement of a well-known watchmaker designed to make people think in terms of the new generation. And similarly, if the Du Pont Viscoloid Company should ask the women of this country this question, "Was the toilet set you use in style in the days of artificial hair and rustless corsets?" the answers would necessarily be "Yes." For there has been no radical style change in toilet-ware in the past twenty-five years. Yet during this same period, the world has seen the greatest changes in style and in manner of living that have ever taken place in a like period.

Recognizing this need for an entirely new type of toilet accessories, the Du Pont Viscoloid Company carried on an exhaustive market survey followed by technical development work, extending over a period of more than a year.

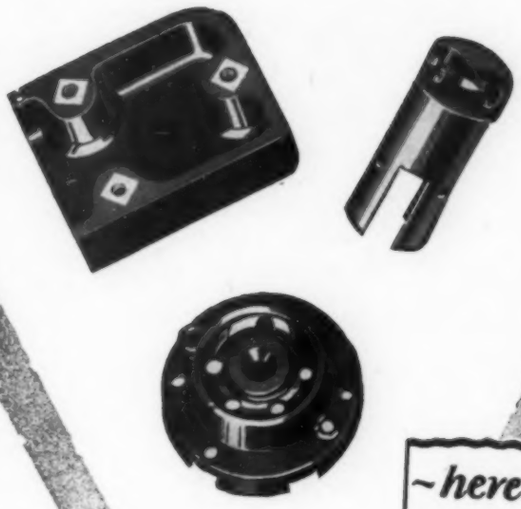
First the company gathered together a group of leading stylists and designers and sent them into the market to find out definitely the latest style trends in boudoir decoration.

As no complete style research for toilet accessories had ever been made, it was necessary to make the survey so wide and so authoritative that it would give a true cross-section of what American women of taste were actually demanding in merchandise affected by style.

The survey was conducted by the designing staff of the company in association with Ben Nash, a well-known merchandise stylist, and Mrs. Verna Cook Salomonsky, a leading architect and decorator and foremost authority in New York on Empire, early American and Eighteenth Century design. Not only were modern trends consulted here in America, but studies were also made by the du Pont Style Bureau in Paris. The Du Pont Viscoloid Company was also successful in securing the cooperation of the Industrial Arts Service of the Metropolitan Museum of Art, in New York City.

The survey developed a wide range of data. It showed that American women of taste are intensely interested in toilet-ware articles as an important part of the boudoir; that they desired articles which would truly harmonize with the other beautiful things in their homes; and that they were alive to the

*Reprinted from The Du Pont Magazine, October 1928.



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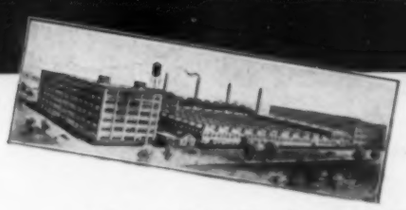

Main offices and Plant, Scranton, Pa.

Auburn Plant, Auburn, New York

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attraction of color and period design.

In order to insure success, both the designs and the colors of any new toiletware must appeal to every part of the market. Since the investigation revealed that certain period designs were increasing in popularity, it was found necessary that both the period designs and the modern arts be given a distinctively feminine appeal. After further consideration of authorities, three of the most popular types of design were chosen for the new patterns.

A design from one of the greatest art epochs of Old China, a classic motif from the brilliant French art period under Napoleon, and the gorgeous bloom of the exotic orchid have inspired these latest of designs on this latest and most distinctive line of toilet accessories.

The "Ming" design was selected because it had always been distinctive and was found to be increasing in popularity. Reports from Paris and from the style centers of this country showed that it was not only admired for itself, but also had a prominent place in many newer forms of art.

The feature of this toilet set is an authentic adaptation of the hawthorn blossom design found on rare vases of the Ming Dynasty as shown in many examples on display at the Metropolitan Museum of Art in New York City. This pattern is made in three colors: Sea Jade, a beautiful, translucent jade-green, almost an exact reproduction of the costly porcelain made centuries ago in far-off Cathay; Mandarin Red, a vivid, intense red distinguished by its wealth of glowing colors; and Jet Black, a smart fashionable color that will lend charm to any boudoir.

The charm and refinement of the Empire motif have always appealed to people of taste, and the survey showed that there was a distinct increase in the popularity of this type of design. This led to the creation of an "Empire" set, which is authentic in every detail and particularly appropriate in adaptations of early American or Empire bedrooms now so popular. Its beautiful colors—Imperial Green, Napoleon Blue and Colonial Buff—were favorites in Napoleon's day and, strangely enough, are actually the three most popular shades now used in boudoir decoration.

"Orchis," the third pattern, was created by Nash, the stylist, inspired by the exotic bloom, the orchid. Floral designs have always been very popular but today they seem to stand in higher favor than ever before.

Next came the production problem. How to get the results which creative styling prescribed necessary? It did not take long to discover that Pyralin in its present form was not appropriate. Therefore it was necessary to develop a new type of material.

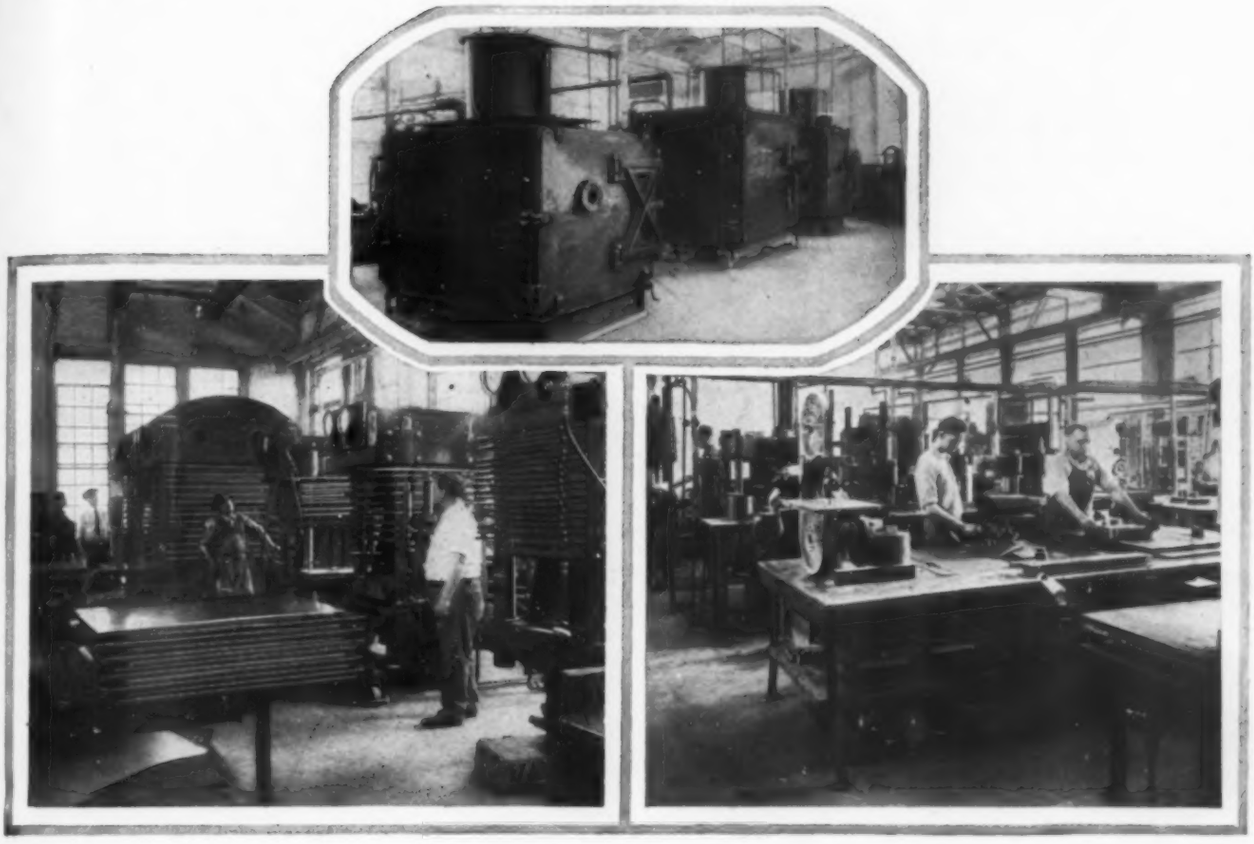
The new material could not be something merely different and unusual, but a product that would combine the most attractive qualities of other cherished materials—the brilliance of semi-precious jewels, the beautiful translucency of porcelain, the smart hardness of jet and the soft feel of jade.

After a careful study of the use of color in modern interior decoration, the du Pont stylists selected the exact shades for the new material. Hundreds of experiments were made by du Pont chemists before the exact colors, degree of translucency and the other desired characteristics were perfected. The result was a new material—Lucite. It is not an imitation of any other material. It is a new material having exclusive characteristics of its own. It is from the material these new boudoir accessories take their name—Lucite.

Early in the study, the stylists determined that the new toiletware could not be restricted in embellishment, as it had in the past, by mechanical limitations. To be smart and modern it must be possible to have unlimited use of color and design. It was also considered essential that a type of decoration be developed that would make possible true and authentic reproductions in fine detail.

To achieve this, du Pont engineers developed a new process which makes it possible to reproduce, in any colors or number of colors, in any position on the article, any design or pictorial treatment desired, with practically the same accuracy of detail as the finest magazine illustration. The designs are not applied on the surface of the articles, but are incorporated as an integral and permanent part, completely protected from wear.

(*Please turn to page 595*)



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By A. C. Blackall

British Correspondent

THERE has recently been incorporated in England a new company under the name of J. M. Newton Vitreo-Colloid (1928), Ltd., whose object is the manufacture of a new plastic substance known as vitreo colloid. The chairman of the company is John Newton, well-known as the head of John M. Newton & Sons, Ltd., the famous London plate glass merchants.

At the first statutory meeting of the new company, which has just been held in London, the chairman reported on progress made since the incorporation of the company. He said that, after a considerable amount of trouble and careful thought, a building site at Dunton Green, near Sevenoaks, had been purchased, this site having been selected as being sufficiently near London for the purpose of easy transport of material, etc. The atmosphere and subsoil are also eminently suitable for the construction of a factory and for the manufacture of the company's products.

After having paid for this land, the company has approximately £130,000 ($650,000) capital in hand, which is ample for all the purposes required. The plans for the building are in active preparation and have been so designed that it will be in its way a model factory, specially constructed for the requirements of vitreo colloid production and up to date in every way in all methods of time and labor-saving construction. It is confidently anticipated that this building will be well advanced in the new year. Meantime the firm is proceeding with the construction of its special machines, which are of its own design and are the last word in this type of machinery. They are being made from special secret and patent designs elaborated by the firm's staff, and will not be available for any other manufacturers for a similar product to vitreo colloid. The construction of the factory and the machinery are proceeding on parallel lines, and the one should be ready for the other so as to ensure the equipment of the works in the minimum amount of time.

J. M. Newton & Sons., Ltd., who are large shareholders in the new undertaking, are very eager and are hard taskmasters, according to J. M. Newton himself. He is therefore urging the venture forward in its constructional activities in order to insure that the capital involved shall as soon as possible be returning interest to shareholders. He is confident that this will not be long delayed.

Vitreo colloid in sheet form of various substances, widths and lengths, is a satisfactory substitute for and an improvement on glass, celluloid, mica and transparent paper. It can be perfectly transparent, can also be produced in any color (both transparent and opaque), is non-inflammable, airtight, aseptic, greaseproof, and transmits an appreciably higher percentage of ultra violet rays than ordinary glass. As a substitute for glass it is its equal in transparency, having none of the yellowish tinge usually associated with celluloid. As a substitute for celluloid, it can be molded for use in the manufacture of boxes and other containers, toilet requisites, chemists' sundries, etc. In addition, it can be used for electrical insulating work in place of mica, and for accumulators and the building up of commutators. Its advantages over glass are its lightness—it is only one-half the weight—and its equal transparency. Moreover, it can be bent without fracture, an advantage which renders it an important necessity in the manufacture of automobile windscreens, etc. In this connection it may be found superior to the various safety three-ply glasses now on the market. Most of these glasses have a central layer of celluloid which considerably mars their transparency. Vitreo colloid will introduce the same safety factor to three-ply glass without reducing its transparency.

In the automobile trade vitreo colloid is now being given national publicity by G. Beaton & Son, Ltd., Willesden, London, who are advertising its advantages as an all-weather equipment of perfect visibility, flexibility, and non inflammability. This firm has been appointed sole agent for the product in the automobile trade.

Yet another of the manifold uses of the new substance is as a cement for forming capsules for sealing the tops of bottles. The vitreo colloid system of capping bottles eliminates the use of any other type of seal, including leaden capsules. The method of use is simple, and consists of dipping the neck of the bottle into a solution, thus producing a capsule which hermetically seals the bottle with an effective finish at less cost than any other form of capping of equal quality. It is both damp and grub proof, resists heat, humidity and acids, and does not crack, chip off or deteriorate with time. The solution can be obtained in any desired color.

While the vitreo colloid capsule cannot be removed whole, as in the case of leaden capsules, it presents no difficulty to the bottle washer. The film can be cut away from the bottle neck leaving it quite clean, thus obviating the necessity to scrape returned bottles as in the case

(*Please turn to page 594*)

Announcement
To the Molding Industry

POLLOPAS MOLDING POWDER

Producing perfect molding in beautiful translucent and opaque colors, from pure white upwards. Fast to light shades with the highest gloss that is also resistant to solvents.

Unequaled strength.

Free flowing material which permits pelleting.

Entirely suitable for all general molding purposes.

POLLOPAS molding powders are Aminoplastics

We are the originators of this field and hold over 150 granted patents throughout the world Including the following basic U. S. A. Patents, No. 1,458,543, No. 1,460,606, No. 1,507,624, No. 1,625,283, and we have a large number of important applications pending. Interested parties are notified that all rights will be vigorously upheld.

Kunstharzfabrik
Dr. Fritz Pollak
Vienna, Austria

Pollopas, Limited
Nottingham
England

This advertisement was radioed to *Plastics*.

Trade Mark Rights Extended To Advertising Novelties

By Waldon Fawcett

Uncle Sam makes a seemingly insignificant modification of his administrative policy and behold an enlarged vista of demand opens before the marketers of molded products. Is a composition specialty adaptable to the purposes of an advertising novelty? Or, is it suitable to use as a premium or a token of good will in business? Answer "Yes" and you have declared your participation in the good news from Washington.

To appreciate the new satisfaction which may attend the distribution of a wide range of molded products, it is necessary to know something of the spirit of dissatisfaction that, growing with the years, has brooded over many users of advertising novelties, souvenirs, prizes and service accessories. It is an unrest in the slightest degree to any lack of variety in the merchandise or a quarrel with the prices. With the rapid development of molded products, and the economies of quantity production, it has been possible to place on the market an imposing diversity of useful and ornamental novelties, all available at quotations that permit the free distribution of the specialties for advertising purposes, or their sale at nominal sums for the sake of cultivating good will.

Rich in the breadth of the stock line that is theirs for selection, many premium and gift users and seekers of display adjuncts have been secretly sullen or resentful. Probe the pout, and you find that it is due to a lack of ability to reserve, restrict, or monopolize the novelty that an advertiser accounts peculiarly his own,—perhaps because he was the first to make use of the device, or has employed it most extensively. What the average user of advertising novelties, premiums, etc., nurses as a secret ambition is a desire to "sew up" an advertising idea expressed in the form of a "remembrance."

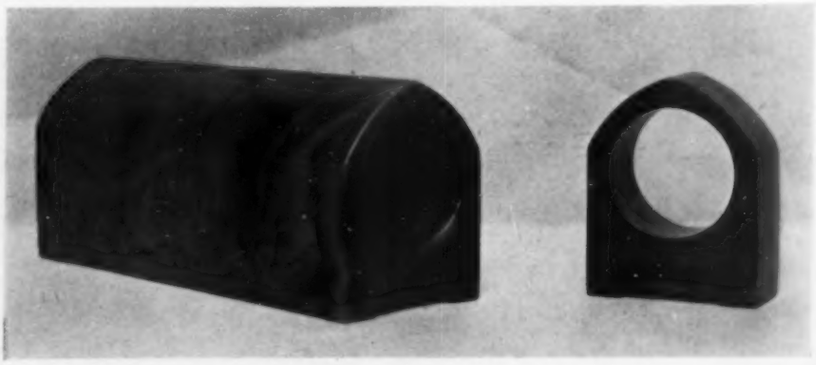
Circulators of novelties, who face realities, have become pretty well reconciled to the fact that, in the average instance, it is unreasonable and futile to expect a manufacturer to, in effect, turn over one of his stock models for the sole use of a single customer. Oh, to be sure, if the customer has designed his own novelty and has obtained or applied for a patent his dream may be realized; for then the manufacturer becomes no more than a contractor. So too, in a rare instance, a buyer of novelties may be willing to contract for so large an output that it pays the manufacturer to assign a design or device to him exclusively. But, generally speaking, broadly utilitarian novelties are not open to appropriation singlehanded.

Compelled to give up hope of monopolizing any novelty found in the open market, the advertiser has sought means to intimately associate his chosen specialty with his business or his main line. This ambition usually takes the form of a wish to so brand, surcharge or identify the specialty that the connection will be unmistakable and, in the case of service helps, use may be restricted to the donor's line. The long and the short of it is that the average advertiser who invests money in "helps"—dealer helps or salesman's helps or what not—wants to receive full credit for his generosity and thoughtfulness and desires to make sure that no competitor can steal his thunder.

The obvious and the logical means to accomplish this control of "good-will builders" is to invoke trade mark rights. If the advertiser could trade-mark his novelty—registering the mark in his own name,—or if he could extend the trade mark from his main line to the side line or supplementary gratuities, all would be well. He would make sure that the public would see the advertising relationship. And he would effectually prevent any rival from diverting any of the advertising honors.

For all that trade mark registration by the novelty dispenser or specialty donor has promised

A "log" of Catalin out of which clock cases are cut.



so richly it has, until now, been out of reach. Keepers of the Trade Mark Register at the U. S. Patent Office have steadfastly refused to pedigree marks so situated. It was not that advertisers cannot qualify as manufacturers of the novelties they circulate. The rules of Uncle Sam's clearing house for trade marks state that the owner of goods, no less than the maker, may qualify as a trade mark owner. Where the rub has come is that novelties are usually employed for advertising purposes. The Federal law does not accept advertising use as a masis for trade mark ownership. Rather is it stipulated that the use of the mark shall have been a trader's use on articles passing in interstate of foreign commerce. Thus blocked in a pet ambition, many advertisers have sulked in their tents.

The autumn of 1928 has suddenly brought relief. As the outcome of a test case precipitated by the Chrysler Sales Corporation, the Federal censorship has become much more lenient with respect to the extension of marketer's trade marks to subsidiary lines even though there is reason to suppose that the novelties or other extras will be employed primarily for advertising purposes. As it happens, the vehicle that brought this new freedom was not a molded product. The medium of the test was the overalls and work garments which the manufacturer of Chrysler motor cars supplies to garage employees and service station mechanics. But the character of the merchandise is, of course, a detail that is of no consequence. It is the principle that has been established that counts and that should operate to give the entire novelty line a new lease of life.

It is important enough that there has been established in this epoch-making precedent, the right of a giver of prizes, premiums, or gifts to trade mark his souvenirs and good will tokens, even though he does not manufacture them and even if he handles the novelties only as a feeder or "booster" for his

Flawless!

FLAWLESS, indeed, for Norton's scientifically correct methods of custom molding, assure perfection of *every* molded part. The last is like the first . . . identically! There is never a variation in size, color or finish. Every piece is perfect. And why shouldn't it be when every step has been so carefully worked out? Molds, accurate to a thousandth part of an inch . . . consistent heat and pressure . . . skilled molders . . . all combined to assure perfection in the finished product.

Take an inventory of the parts you are now having cast, large or small, then send us a sample and let us show you how Norton molded parts of *durable* Durez or Bakelite can be substituted, giving the same strength and durability of a cast part . . . plus beauty! Yes, and how a Norton molded part will actually *reduce* your manufacturing costs on that particular part.

Our Research and Engineering Departments are ready to help you with your molding problems. The mailing of the coupon places you under no obligation. Mail it today!

NORTON LABORATORIES, INC.

Custom Molders of Durez and Bakelite

Lockport, New York

Nor·loc

The Trade Mark of Quality

NORTON LABORATORIES, INC., LOCKPORT, NEW YORK

Please send samples of your molded parts for our inspection.

*Name*_____

*Type of Business*_____

*Address*_____

When writing Norton Laboratories, please mention *Plastics*

principal line. It is yet more important, from the standpoint of the molded products trade, that the way has been opened for manufacturers of commodities of various kinds to extend or transfer their trade marks to advertising novelties not otherwise identified. This spells Opportunity for molded product supply houses, because it is bound to stimulate the use of advertising novelties in the guise of composition reproductions of well-known trade marks or trade mark characters.

When the Chrysler Corporation sought to register the same trade mark that it uses on its automobiles, as a badge for jumper overalls, it was told, as so many other firms have been told, that it could not be done. The U. S. Trade-Mark Examiner took note of the fact that the identifying device, as it appears on the back of the work garment, is of much larger size than the display on the car where it originally appeared. Hence he concluded that there was no trade mark used but that the placarded premium served merely as an advertisement for the automobile. Or. if not that, the use of the mark was on a par with the use of the word "Child's," written across a suit worn by a waiter in a Child's Restaurant. The Patent Office censors, in justification of their attitude, pointed out that they had similarly foiled a prominent American tobacco company when it sought to enter the name of its leading brand of cigarettes as a trade mark for cigarette cases, tobacco pouches, humidors, and other specialties.

Unlike so many others, disappointed in their dreams of trade mark expansion, the latest victim refused to let it go at the first refusal. Chrysler appealed over the head of the regular censor of trade marks, to the authority higher up. And, out of this persistence, came the reward that may be shared by all advertisers who care to follow the lead. In reversing the decision of his subordinate and granting the coveted registration, the First Assistant Commissioner of Patents accepted the view that the appearance of the advertiser's trade mark, in large size, on the supplementary goods, undoubtedly serves an advertising purpose. But he took the position that an imprint of this kind may serve an advertising purpose and at the same time do duty as a trade mark. That is all advertisers have been seeking.

This fresh grant of latitude to advertisers in their trade marking further disposes of the bogey that novelties, which are given away instead of sold or rented, will not support a trade mark. There was a time when official Washington was reluctant to grant trade mark credentials unless the merchandise was bought and sold in regulation manner. In a number of instances it was ruled that the use of trade marks on free samples did not constitute such employment of a trade mark as the law demanded. Latterly, though, the Federal censors have taken the position that even though a novelty or specialty of some value be distributed free yet may it be deemed to have passed in trade, since the donor, in presenting his gifts to customers or prospects, does so with the full expectation of receiving ultimately a "consideration" of one kind or another that will constitute a compensatory return.

For all that this current letting down of the bars at Washington will supply to advertisers a strong added incentive for the use of souvenirs, accessories, novelties, and specialties, the reader must not gain the impression that the trade mark concession means that the name of a novelty may itself be fenced off as a trade mark. If the designation of the specialty is a generic or specifying term it is, of course, wholly outside the sphere of trade mark appropriation. For it is the first principle of the U. S. trade mark system that no person or firm shall be allowed to monopolize, via trade mark franchise, any descriptive word that others in the same line of business may need to specify their wares.

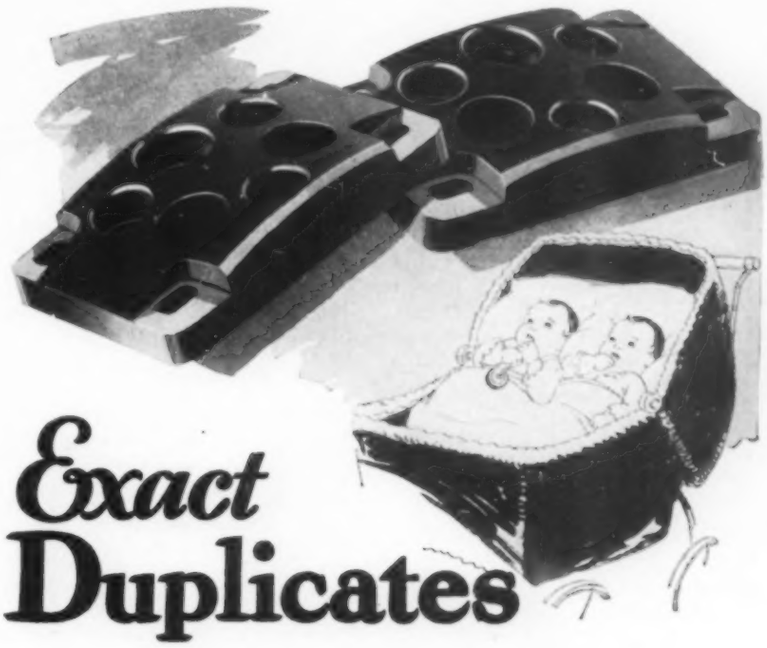
Even though the novelty rejoices in a pet name of its very own, yet are there difficulties. This was well illustrated in the famous case of the statuette "Billiken". After a design patent had been obtained on the molded figure, attempt was made to register the name as a

Bakelite Display at the Recent New York Radio Show

trade mark for the image. This was refused on the ground that, upon the expiration of the patent, anybody would be free to manufacture the novelty and should be at liberty to designate his product by the familiar name. What may be accounted definitely gained, however, by the latest development, is the right of an advertising novelty or good will souvenir to serve as a trade-mark "carrier", enjoying all the same privileges and protection as the parent product.

A
SPECIALIST
IN
CASEIN DIRECT
MOLDING
BUTTONS
of
any size, plain, mottled and ornamental
HANDLES
for knives, parasols, walking sticks, oven door and gas cock, door knobs, carriages, etc.
Cameos, jewelery, boxes for rouge and lip sticks, household appliances, lamp shades and electric fittings and many other different articles
also
sheets—rods and tubes of any standard size and color—
is
seeking connection with a reliable concern which wants to mold its own products. He is known to be the first chemist in America to succeed in compounding and molding casein in finished product—
For information write to:
PLASTICS, BOX 500, NEW YORK, N. Y.

An article on Casein Molding will appear in the next issue of Plastics and Molded Products.



Exact Duplicates

EACH Cetec molded part is an exact duplicate of every other. Your assembly is easier, quicker and cheaper when you use Cetec parts. Metal inserts are incorporated where necessary. No machining, drilling or fitting is required. This saves you money, too.

Cetec not only cuts your production costs—it makes your product better.

Color That is More Than Skin Deep

Cetec now comes in colors. Vivid or dainty colors. Beautiful mottled effects. Any color you want. Cetec color goes clear through the molded substance. It can't wear off, burn off, peel, or tarnish.

Use Cetec color to add selling appeal to your product. Color is more important today than ever before.

Cetec molded parts are hard as rock. They have high tensile strength and transverse strength. They are actually fireproof and have dielectric resistance to meet almost any need. Cetec molded parts cut service troubles to the minimum.

Send us models or blueprints of parts you have under development. Send us samples of parts which are giving you trouble.

MOLDED "CETEC" PRODUCTS

CONNECTICUT
MOLDED PRODUCTS CORPORATION
MERIDEN, CONN.

Recent Developments In Ultraviolet Transmission Through Synthetic Glasses

By Nicholas Klein

SYNTHETIC organic glasses are again engaging the attention of the buying public through widespread national advertising, an indication that such articles have passed the experimental stage and are actually displacing the time-honored, common window glass. That synthetic glasses are no longer laboratory curiosities is attested by the fact that skyscraper office buildings, modern hotels of similar colossal proportions, the largest poultry farm in the world, are all equipped with one type or another of these glasses.

An ideal glass substitute is one that embodies the desirable properties of ordinary glass with all its shortcomings eliminated. The outstanding objection to window glass is its opacity to the universally recognized, health-inducing ultraviolet rays of sunlight, which are transmitted, in greater or lesser degree, by the various synthetic glasses. The brittleness of glass is superceded by the elasticity of the plastic materials adaptable as glass substitutes. Mechanical strength of the substitute over that of ordinary glass is a desirable property.

A vast amount of attention has been given the effect of ultraviolet light, as transmitted by glass substitutes, on human beings, plants and animals. The summary of the report of a large New York clinic on the improvement in the condition of fourteen children, whose ailments included pneumonia, mastoiditis, scurvy, rickets and pulmonary tuberculosis, after thirty days exposure to sunlight transmitted through Vitaglass, is an interesting commentary on the attitude of the medical profession toward such glasses. The daily exposure was increased from thirty minutes to a maximum of four to five hours daily:

"The improvement in the physical well being of these children was demonstrated by a moderate to a well tanned skin, improved color, increased muscular tone, better appetite and in all except one a gain in weight of from ½ to 6 pounds. This gives an average gain for each child of 2.4 lbs. for the month. The loss of one pound by one child can be explained by a restricted diet rather than any lack of appetite.

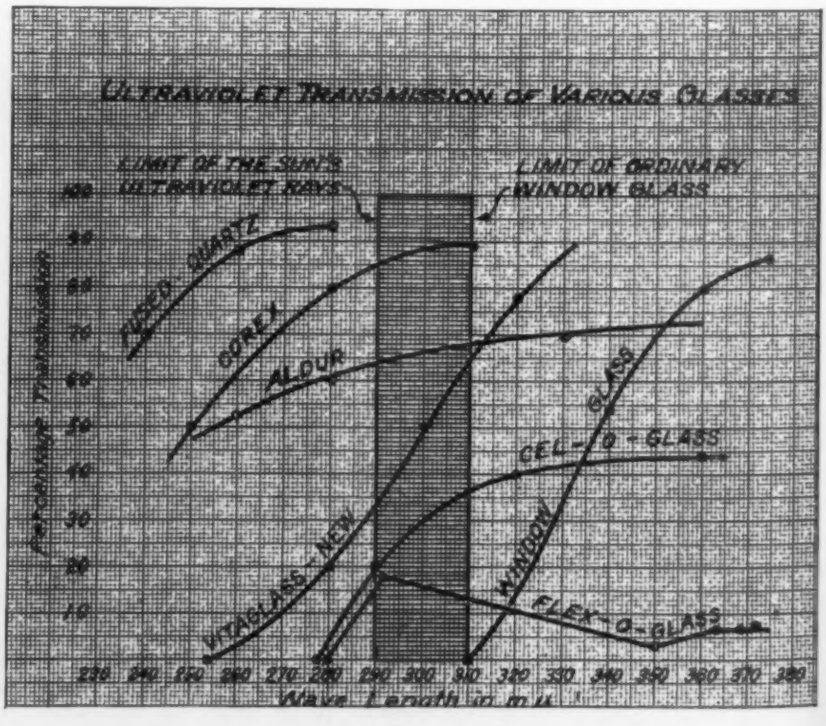
Another rather striking feature of this group of children was the number who showed an increase in the blood phosphorus. There were 8 of these and in 2 the phosphorus increased 5 to 6 milligrams per 100 C. C. for each of these children. Of 2 that had a phosphorus below normal at the beginning, the final phosphorus showed an increase to well above the upper limit of normal. One remained normal and unchanged throughout. Two showed a decrease but still not below the upper limit of normal. The normal blood calcium is 9.6-11.0 and the phosphorus 3.5-5.0 milligrams per 100 C. C. of blood.

During the experiment no medication was given whatever. This was to eliminate any source of error in the blood findings.

The phosphorus increase was rather significant since the final readings showed all with but three exceptions to be well above the normal."

The use of glass substitutes has played a great part in eliminating losses in the poultry industry. By the use of such glasses in the pens, mortality of the chicks has been reduced from 40-60% to 10-25%. The general constitution of hens that get all-year ultraviolet exposure is such that they start laying eggs several weeks sooner than hens kept under window glass. Ultraviolet rays have been shown to be necessary to obtain proper calcium and phosphorus metabolism, which goes toward preventing "leg weakness" in the chicken, and the formation of egg-shell. The Kansas and Wisconsin Agricultural Experiment Stations have shown a direct relationship between thin-shelled eggs and lack of ultraviolet light.

Another of these products is Celoglass, an unbreakable, highly translucent material made by coating tough wire mesh with transparent cellulose acetate that lets through as much light as is usually needed. Cel-o-glass



Plastics Directory, Index and Buyers' Guide

1929

Revised and Enlarged

COMING——!

The Plastics Directory, Index and Buyers' Guide for 1929 is already under way. It will be simpler, more accurate, much more complete and reliable. In other words, it will be ***more useful!*** To facilitate this, listings should be in immediately as well as applications for advertising space, and any suggested revisions will be carefully considered.

It is your index to this field—use it ! Merchandise your product to the desk of every executive in the business.

This coupon is ours, but it is for your convenience. Fill it out and return it immediately ——————→

PLASTICS PUBLICATIONS, INC.
114 E. 32nd St., N. Y. C.

Please send me the information about

☐ (a) Listings.
☐ (b) Advertising rates.

For your 1929 Directory.

.....

.....

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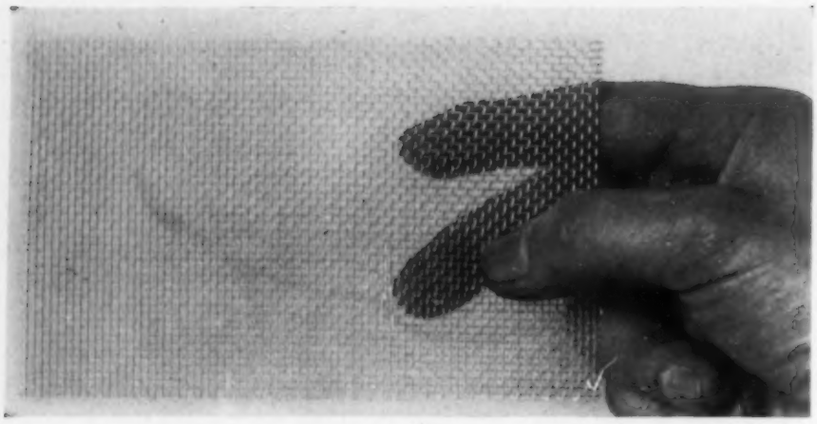

A sample cel-o-glass reinforced with wire mesh.

is very light in weight, absolutely weatherproof, and is extremely easy and economical to use. It is flexible, comes in rolls, and can be used almost any place where fragile glass would be required.

Plants as well as animal life show improvement when exposed to ultraviolet light through transparent glasses. Such glasses have been used for some time in growing tobacco. No better example of its efficacy can be offered than the Australian tobacco crop which invariably was 40% "green", meaning an aroma making the article unsalable, which condition was a result of a weak plant in its early stages of growth. This has been eliminated to large extent by the Vitaglass and Australia has become a figure in the British Empire's tobacco market. In this country, the Parke, Davis Co. has made a study of the ultraviolet effect, as transmitted through transparent glasses, on drug-producing plants. An abstract of their report states . . .

"In a series of tests upon two groups (160 plants) of Digitalis Purpurea, it was found that plants exposed to the Ultraviolet rays during development of seedlings exceeded the controls in growth, and in potency of Tinctures, after later culture under ordinary garden conditions. The higher titres, exceeding the controls by 11.66% to 35% are believed attributable to a carrying over of stimulus from the previous exposure to Ultraviolet rays.

The Bureau of Standards has undertaken an investigation of the properties of new glasses and organic substitutes for window glass and has submitted its report in Circular Letter No. 235 which states that . . .

"A second and more reliable method of measuring the relative transparency of a specimen of glass to ultraviolet light is to determine its spectral transmission curve, wave length by wave length. Curves of this description are shown in the accompanying illustration. These curves were obtained by means of an artificial source of light (quartz mercury arc) giving a line spectrum richer in ultraviolet than the solar spectrum.

By means of these spectral transmission curves an estimate of the relative transmissions of the various specimens for rays shut out by common window glass, may be obtained by reading from the curves the values of the transmission at 302 mu—the wave length of an intense mercury line, of convenient value for making such tests. Table 2 gives transmission values for this wave length. These are our most recent findings for new specimens.

Trade Name	Average Per Transmission at 302 mu. when new
Fused quartz	92
Corex	89
Aldur	65
Vitaglass	44
Cel-o-glass	30
Quartz-lite	0.5
Common window glass	0.0

Solarization

Vitaglass and Cel-o-glass have been found to decrease in transmission at 302 mu and neighboring wave lengths (295 to 310 mu) by exposure to ultraviolet radiation from the sun, quartz mercury arc and carbon arc. The rate of change is much more rapid with the arc than with the sun and varies also with the different glasses."

Aldur, the newest of these, is a clear, transparent urea-formaldehyde product, which has been developed entirely in this country. Its promoters claim for it excellent transparency to ultraviolet rays, with no decrease due to age. Its flexibility and non-shattering properties makes it available for automobile windshields.

Some interesting buttons molded of casein

The buttons shown here were molded by S. Milano

NEWS OF THE INDUSTRY

New Synthetic Unbreakable glass developed in England

Dr. E. C. Baly, professor of organic chemistry, at the University of Liverpool, in collaboration with his son, is mentioned in a news dispatch as the inventor of a new synthetic, unbreakable glass known as "Plass". A plant for its manufacture is being erected in Nottingham, England.

This material is said to be an improvement on "pollopass", the product of Dr. Pollak, the Austrian chemist. "Plass" is claimed to be cheaper than any other glass substitute, is burglar-proof and is translucent to ultraviolet light. It can be molded and machined. The material, when reduced to powder form may be colored with any dye or pigment to produce molding powders of any shade.

The Nottingham plant is to be ready in two months at which time the new glass substitute is to be placed on the market. Professor Baly does not say it will entirely supersede glass but says that its possibilities are illimitable.

Pyroxylin Products in India

WHILE there is no domestic manufacture of pyroxylin products in India, it now seems to be the policy of the provincial governments to encourage cottage industries, viz., unorganized craft work in the homes of certain communities and if the advantages of celluloid and casein plastics, as well as synthetic resins, were better known to the directors of the provincial Departments of Industries and Indian craftmen, a fair trade might be established for the manufacture of simple articles such as beads, bangles, combs, boxes, and toys.

Domestic Exports of Pyroxylin Products, From the United States, by Countries.

Countries	Sheets, rods, or tubes Pounds	Sheets, rods, or tubes Dollars	Manufactures Pounds	Manufactures Dollars
Belgium	323	375	.....	.....
France	.....	.....	23	23
Germany	445	1,189	10	89
Hungary	571	124	.....	.....
Irish Free State	36	62	.....	.....
Italy	31	62	29	69
Netherlands	.....	.....	28	239
Sweden	.....	.....	84	238
Switzerland	.....	.....	5	49
United Kingdom	78,090	50,359	315	639
Canada	148,590	106,906	29,564	41,105
B. Honduras	.....	.....	8	26
Guatemala	.....	.....	40	237
Honduras	20,127	3,798	.....	.....
Nicaragua	.....	.....	127	991
Panama	.....	.....	257	499
Salvador	.....	.....	306	472
Mexico	665	668	1,349	2,762
Newfoundland & Labrador	34	28	40	38
Bermudas	.....	.....	2	6
Jamaica	.....	.....	30	165
Cuba	80	95	2,027	2,357
Dom. Republic	.....	.....	40	106
Netherland W. Indies	.....	.....	30	59
F. W. Indies	22	30	.....	.....
Argentina	237	187	390	522
Brazil	30	41	410	294
Chile	256	275	8	21
Colombia	102	138	266	408
Peru	253	290	.....	.....
Venezuela	15	18	.....	.....
B. India	.....	.....	10	130
China	.....	.....	9	52
Java & Madura	.....	.....	68	20
Japan	1,312	2,123	.....	.....
Philippine Islands	117	175	365	598
Soviet Russia in Asia	.....	.....	107	655
Australia	9,039	7,032	13,710	17,587
B. Oceania	.....	.....	13	23
New Zealand	.....	.....	229	858
Union of South Africa	.....	.....	415	1,019
B. W. Africa	44	18	.....	.....
Total	260,419	173,993	50,314	72,356
Shipments from U. S. to:				
Hawaii	.....	.....	767	1,489
Porto Rico	.....	.....	427	627

German Button Manufacture

THE production of buttons in Germany is rapidly becoming chemical industry owing to their manufacture from galalith, artificial horn, and other synthetic substances. However, in view of heavy competition in Europe negotiations are now taking place between German, French, and Czechoslovak button producers looking toward the formation of a cartel which would apportion markets and fix prices. Although no serious obstacles appear to confront the German, French, and Czechoslovak manufacturers in the consummation of an agreement, the absence of Italy is regarded seriously, owing to the fact that it is a large producer of buttons and has a large and growing button export trade. (Consul Hamilton C. Claiborne, Frankfort on the Main, Germany).

Soy Bean Casein In Japan

AN interesting account comes from Japan concerning the Soy bean casein. It appears that the process of manufacturing soy bean casein was discovered some seven years ago and the patent was bought from Sato, the discoverer, by the Sankyo Drug Company, of Tokio. The company then started to manufacture casein, in the hope of being able to replace the imported milk casein, which was largely used in Japan, with soy bean casein. The cost of the manufacture of this casein, was however, too high to compete with the imported milk casein,

These Trademarks

ELECTROSE

stand for
Quality . . .
Dependability .
Accuracy . . .
and
Service . . .

For parts that are outstanding examples of custom molding; for service that insures the most exacting attention to every detail of every job.

Insulation Mfg. Co. Inc.

General Insulate Co., Inc.

New York Ave. & Herkimer St.

BROOKLYN, N. Y.

If you are in the market for molded articles, we would like to send you representative pieces of our work. Your request will receive our immediate attention.

MOULDERS OF PLASTICS & BUILDERS OF MOULDS

An intricate molded bakelite gear.

KUHN & JACOB MACHINE & TOOL CO.
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and it was also found that the soy bean casein absorbed moisture to a large extent and was not suited for Japan's climate.

The largest users of casein in Japan are manufacturers of plywood and veneer. It was found that soy bean casein, when made into glue, lost its elasticity during damp weather. Professor Matsumoto has now discovered a method of making soy bean casein and is using it in the manufacture of paracasein, which is a new venture and will require at least a year before being produced in appreciable quantities. It is stated that there seems to be little competition between soy bean and milk casein unless manufacturing methods can be discovered which will overcome the disadvantages.

Duty on Insulating Materials

SUSTAINING protests of W. D. Grotte, of Cleveland, the United States Customs Court finds that imported insulating material, composed of a mixture of cellulose ester or ether, dye, China clay, and barytes, is not a compound of cellulose esters or ethers, and should not have been assessed by the collector at the rate of 40 cents per pound, under Paragraph 31, Act of 1922. Duty is fixed at 25 per cent ad valorem, under paragraph 5.

In the same ruling, the court finds that certain iron drums used in the transportation of this merchandise were correctly taxed at 25 per cent under paragraph 328. Claim for free entry is denied.

THE resignation of Mr. W. L. Filmer as Chicago District Sales Manager, effective October first, has been announced by Monsanto Chemical Works, St. Louis, Missouri. The company will continue to have his advice as consultant and Special Representative.

Mr. Frank T. Robinson, who has been with Mr. Filmer during the year, will be in charge of the Chicago territory.

New Pamphlets

Coumarone Resins. Booklet of Rubber Industries, Ltd., Tottenham, London N. 17, 1928; gratis.

Albertol Booklet No. 18 of Scott, Bader & Co., Ltd., Broad St. Place, London E. C. 2.

Molders of Bakelite and Bakelite Laminated: Directory issued by Bakelite Corp., 247 Park Ave., New York, 1928.

Statement of ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912 of Plastics published monthly at Washington, N. J., for October 1, 1928.

State of New York, County of New York, ss.: Before me, a Notary Public in and for the State and county aforesaid, personally appeared R. C. Gilmore, Jr., who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Plastics Magazine and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Plastics Publications Inc., 114 E. 32nd Street, New York City; editor, Carl Marx, 114 E. 32nd Street, New York City; managing editor, R. C. Gilmore, Jr., 114 E. 32nd Street, New York City; business manager, R. C. Gilmore, Jr., 114 E. 32nd Street, New York City.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member must be given.) Plastics Publications Inc.; R. C. Gilmore, Jr., 114 E. 32nd Street, New York City; R. C. Gilmore, Sr., 114 E. 32nd Street, New York City; A. K. Gilmore, 114 E. 32nd Street, New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) Sylvan Hoffman, 114 E. 32nd Street, New York City.

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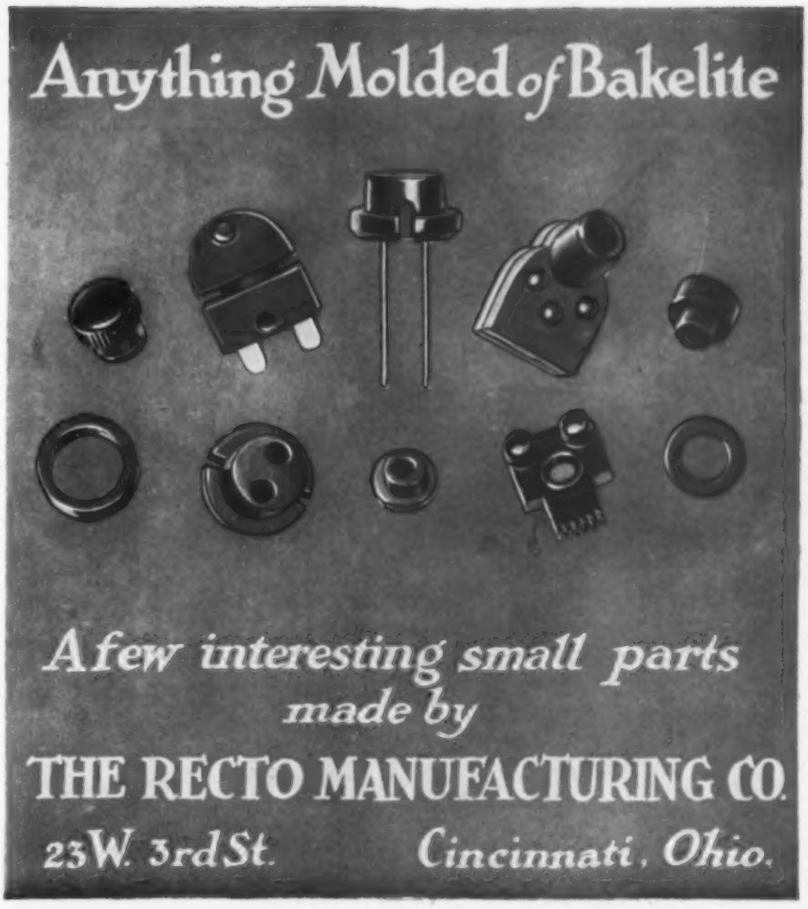
5. That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is .....
(This information is required from daily publications only).

R. C. GILMORE, JR.
Business Manager.

Sworn to and subscribed before me this 29th day of September, 1928.
(SEAL) JAMES J. DOOLEY.
My commission expires March 30, 1928.
Form 3526—Ed. 1924.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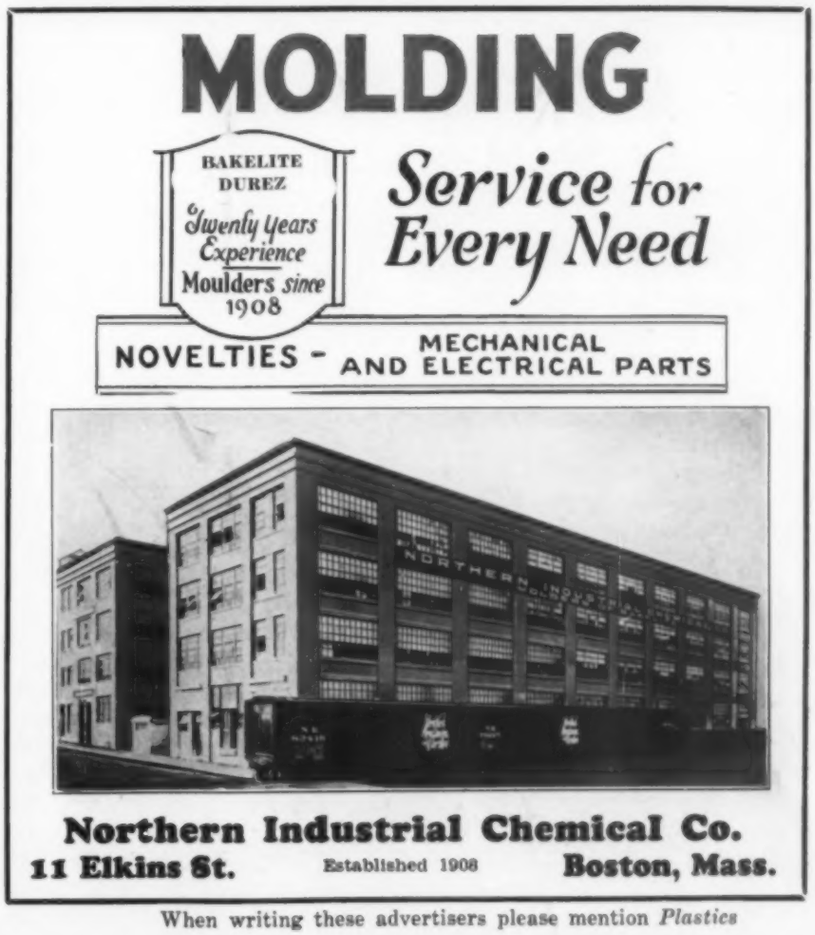

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Say you saw it in PLASTICS

Big Undertaking Formed in London to Produce New Plastic

(*Continued from page 583*)

of sealing wax or adhesive capsules. The advantages which the vitreo colloid capsule offers to the bottling trade in general are many.

The neck of the bottle is dipped into the solution at a slight angle to prevent air bubbles. When at the required depth of cap, one brings the bottle to a perpendicular position, thus ensuring an even finish round the neck. When the last drip is ready to fall the bottle is redressed. Any remaining drip will level itself out when the bottle is placed in an upright position.

The capping solution is put up in one-pound tins for the convenience of those desirous of trying the minimum amount, at 4S. ($1.00) per tin. Special quotations are, of course, made for quantity lots. The lid of a tin of solution must always be tightly replaced when not in use.

The correct consistency of the solution is maintained by the addition of the solvent (acetone commercial B. G.$_5$) as and when the solution shows a tendency to thicken. It is recommended to the wine and spirit trade that when wines and spirits are put down to mature, the solution should be applied in a slightly thicker state.

The vitreo colloid capsule is non-inflammable in the dry state, but as the liquid itself contains a percentage of acetone, it is necessary to take the same precautions as when working with products containing alcohol. The flash-point is 752° Fahrenheit. The product is not detrimental to the health of the worker, and does not transmit any bad taste or odor. An important advantage of the vitreo colloid cap is that its polished surface repels dirt and retains its clean appearance indefinitely. The capping solution is being marketed by S. Murray & Co., Ltd., Record House, London.

At present the company is in a dilemma with regard to the divulgence of information. While desirous of keeping the shareholders informed as to what is going on so that they can see the progress which is being made, the time is not yet ripe to divulge very much, as experiments are still in progress for the improvement of the product. In this connection great progress is being made in the development of side lines which will be of considerable profit and

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a source of revenue when manufacturing starts. At present there are three or four side lines, for which patents have been applied, for the use of vitreo colloid in special ways. These patents range from matters dealing with radio, electrical work, and several important commodities. Mr. Newton has expressed his assurance that they will meet with a ready sale and yield profits quite outside the firm's main manufacture of the raw vitreo colloid material.

Vitreo colloid is to be exhibited at the forthcoming London Motor Show, which is the biggest annual auto exposition in the world. It will also be displayed at the British Industries Fair next February, adding one more to the ever-growing list of concerns exhibiting plastic products at that great world-market.

Negotiations are proceeding for the establishment of works closely connected with the firm's proposed factory at Dunton Green, for the manufacture by a separate concern under which the new undertaking will have a contract for the supply of its raw material on the most advantageous terms. All these subsidiary organizations using the raw vitreo colloid are being encouraged to build near the main factory. One particular form of manufacture is now under test with the largest electrical firms for the purposes of insulation, and it is anticipated that large contracts for the supply of vitreo colloids will be entered into as a result of these experiments.

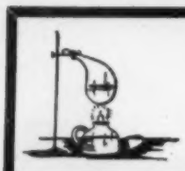
Research in many directions is being actively prosecuted by the company in its endeavor to increase the uses of its product. When at the company's offices recently, the writer was shown a number of electric light bowls for use in concealed lighting schemes. Such bowls made of glass, marble, alabastar or other well-known material depend a heavy weight from the ceiling and, were they to crash, would be smashed beyond repair. Molded from vitreo colloid, they are unbreakable and only a fraction of the weight, while at the same time possessing all the desirable features of their more costly competitors. Moreover, due to the acetate base of the material, vitreo colloid is stable, inert, and hygienic.

With the product which the firm has, and the machinery which it has developed to produce that product, Mr. Newton is certain that nothing stands in the way of a tremendous future for the new venture.

New Vogue in Boudoir Accessories

(*Continued from page 580*)

The survey also showed that there was a vogue for the new type of accessories that were not thought ordinarily necessary in the modern toilet set. Women had acquired new habits, new ideas as to the utility of vanity boxes. As a result, a new series of boxes, including a beauty box, a manicure chest, jewel case, and a cigarette box were made in harmony with the designs and colors of all Lucite patterns.



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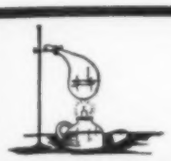

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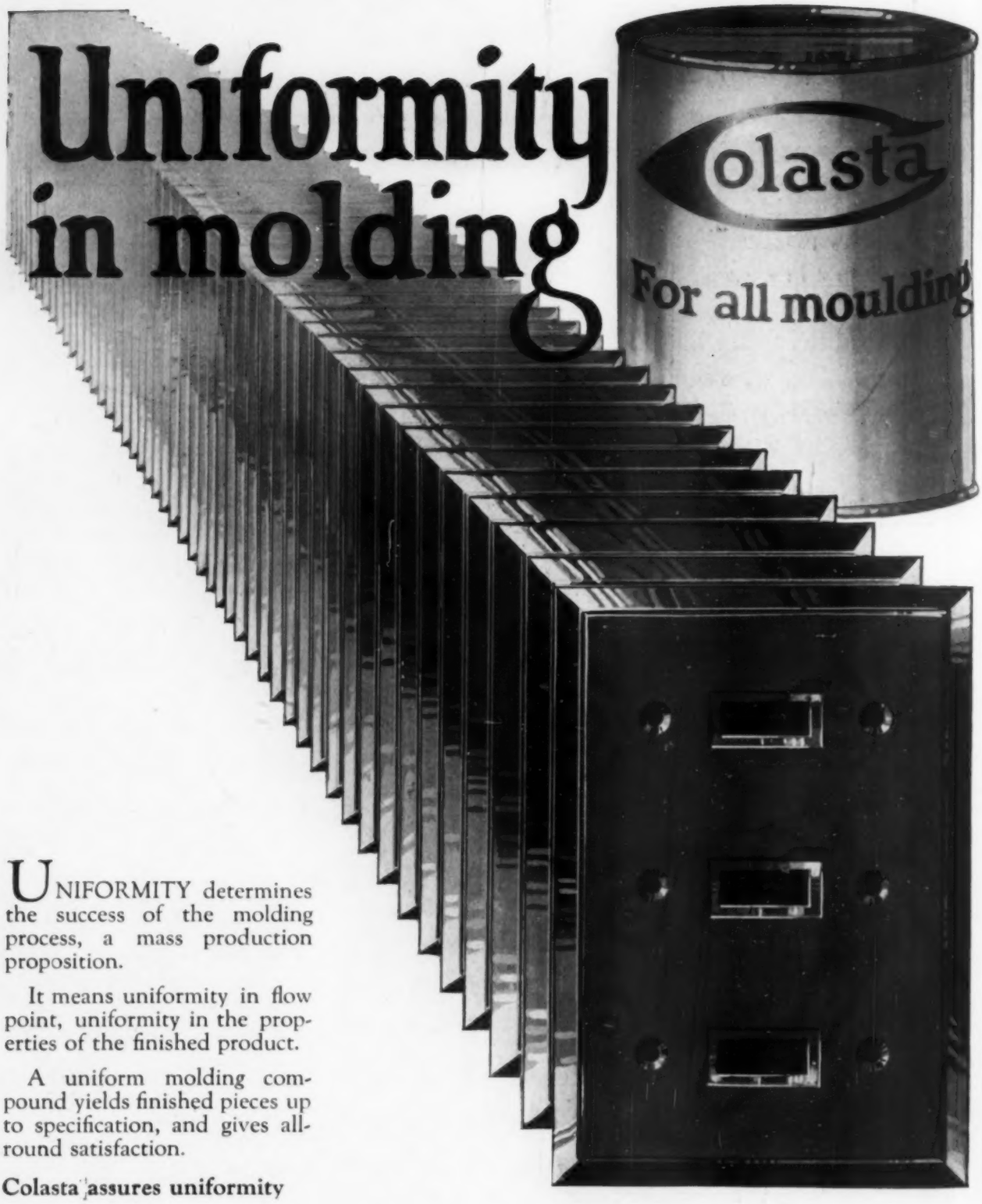

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